Light and LIGHTING

NOVEMBER, 1958 PRICE 2s. 6d.

An excellent example for less well-lit neighbours — here is someone in the lighting business who obviously believes in taking his own medicine.

Focus on Shop Lighting

While some shops in our town and city centres have always been lit as well as any in the world, there are still too many others where modern equipment and the important part light has to play in efficiency, hygiene and decoration are not appreciated.
Here is a vast field for lighting improvement and this winter one of the major activities of the British Lighting Council will be a Campaign for better shop lighting.
All branches of the lighting industry are giving their support and there is every reason for supposing that the coming months will mark the beginning of a long overdue revolution in the lighting of small shops all over the country.

The British Lighting Council Ltd.

Founder Members:

The British Electrical Development Association
The Electric Lamp Industry Council
The Lighting Equipment Development Council

Designed by
R. F. Steward, L.S.I.A.,
of Falks.

from FALKS range of outdoor lighting fittings

'Beaufort'

This range comprises three fittings for post top mounting and two for wall mounting, each being available in six different forms. For use on roads, entrances to public buildings, hospitals, promenades, parks, gardens, garages, etc.

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AF 87

We of The Benjamin Electric Ltd., are proud of our long association with the Electrical Industry and we offer our grateful thanks for all the help and encouragement received during the past fifty years. To our customers we are equally indebted for their co-operation during the same period. It is the aim and desire of our world-wide organisation on this our Golden Jubilee, to maintain and strengthen in future years the prestige of the industry of which we are part.

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Smee's 128

THE STEEL TUBE AGE

The artist's impression shows S & L lighting columns on Merdeka Bridge installed by the Singapore City Council.

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The columns cover a variety of outreaches and the bracket arms can be adapted for various types of lantern.

The lighting equipment illustrated was supplied by A.E.I. Lamp and Lighting Co. Ltd.

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. . . but nowadays it's 'DIAKON' for street lighting fittings

A lantern and refractor, which are injection moulded in 'Diakon' acrylic moulding powder, have the following properties:

- **Good appearance.**
- **Consistency of production.**
- **Ease of maintenance.**
- **Efficient light control.**
- **Toughness.**
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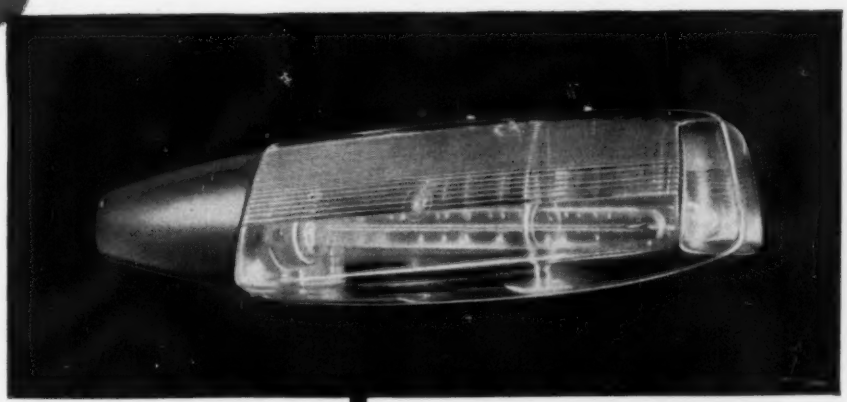
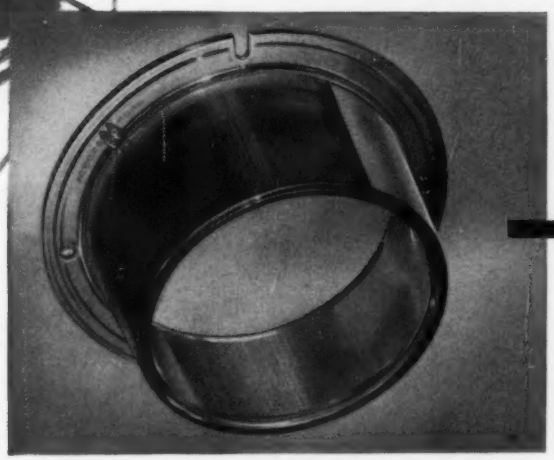


GROUP 'A' STREET LIGHTING. The 'Atlas' Opticell sodium lantern, manufactured by Thorn Electrical Industries Ltd., represents a new development in lantern design for Group 'A' road lighting. The interior of the lantern is sealed against ingress of dirt, insects and rain.



GROUP 'B' STREET LIGHTING. The 'Dielikon' refractor is manufactured by The Wardle Engineering Co. Ltd. for Group 'B' road lighting, and is used with metal filament or mercury vapour lamps. Very efficient light control is obtained from a sealed refractor system, and only smooth surfaces are exposed, which facilitates cleaning.

'DIAKON'

'Diakon' is the registered trade mark for the acrylic moulding powder manufactured by I.C.I.

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LANTERNS
for use with
MERCURY LAMPS

Z8430CM

ACCEPTED BY M.O.T. for MAIN ROAD LIGHTING

The new G.E.C. lanterns illustrated have been designed for main road lighting and have a medium angle beam distribution, using an Osram 250 watt or 400 watt mercury colour modified type MBF/U or mercury type MA/V lamp.

The Z8430CM has been specially introduced for use with colour modified type MBF/U lamp and the Z8430 with the type MA/V lamp, using a magnetic deflector.

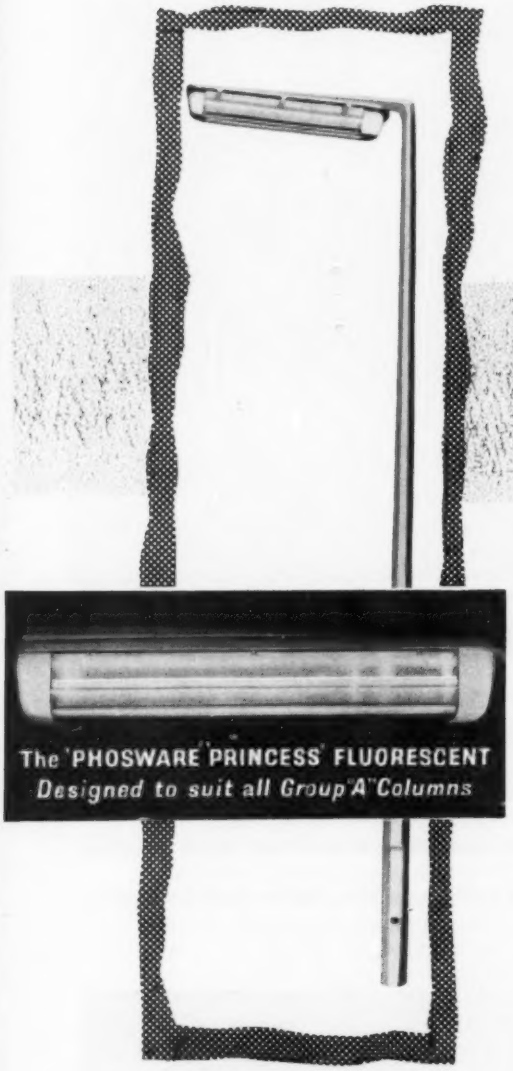
Outstanding features include :—

- Each optical system designed to give maximum efficiency with the type of lamp used.
- Maximum amount of light directed on to carriageway and adjacent area on both sides.
- Very pleasing appearance by day.
- Lantern bodies made in die-cast light alloy.
- Available for top or side entry mounting.
- Die-cast hinged ring with quick-release toggle catch supporting the refractor bowl.

Z8430

THE GENERAL ELECTRIC CO. LTD.
Magnet House, Kingsway, London, W.C.2.

world wide demand!



Highway "X" column with
"PRINCESS" Lantern 25 ft. MH.

Fluted column with "PHOSWARE" "GEORGIAN" Lantern 15 ft. MH.

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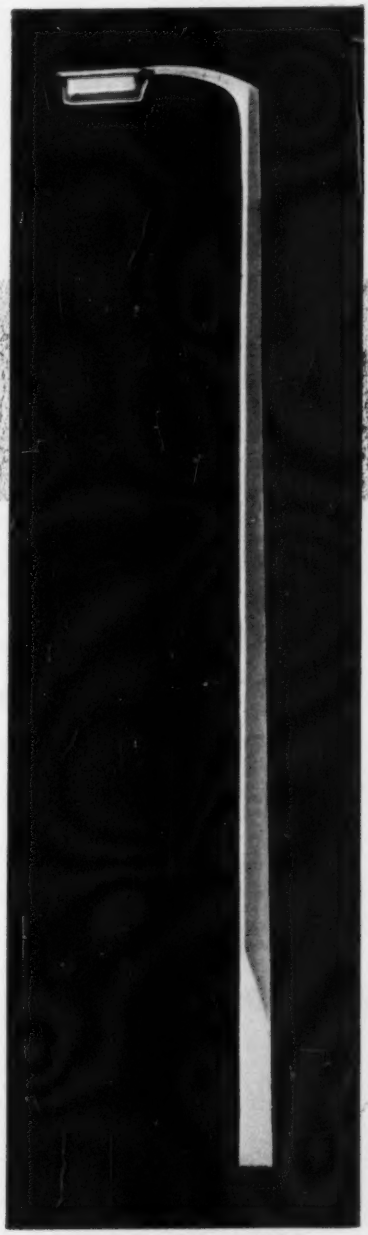

Avenue 3 DNN column 25 ft. MH
"PHOSWARE" S.O. 140 Sodium
Lantern.

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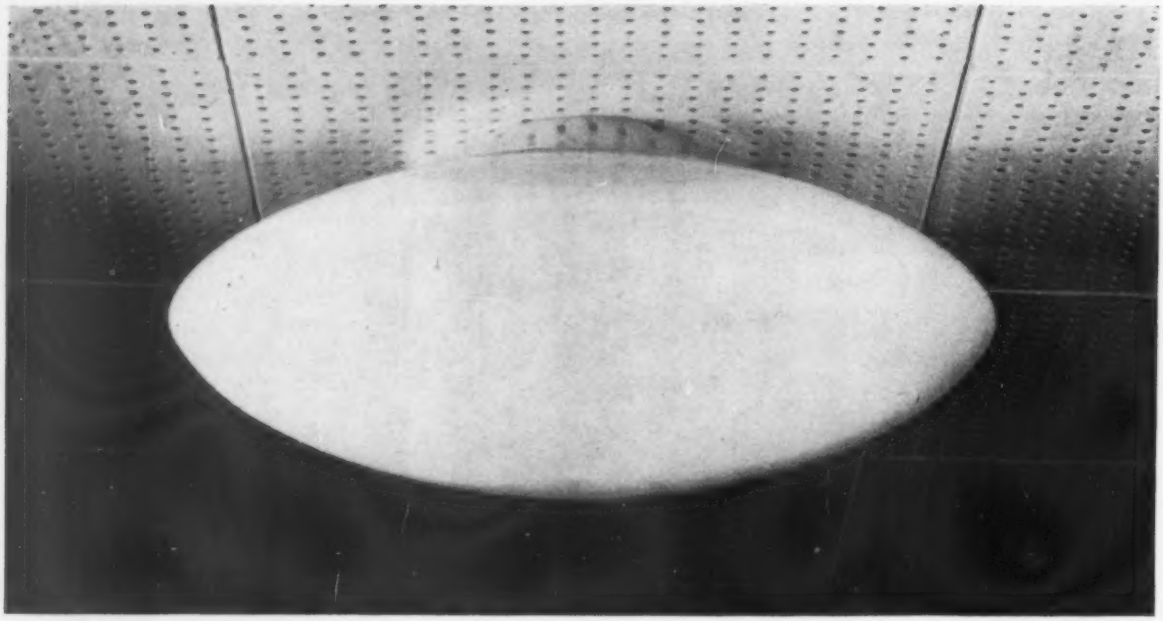

MA 1500 series from **34/8** plus tax

Designed by Paul Boissevain, Dip. Arch. M.S.I.A.

announcing the new **ELLIPSE SERIES** 10″ 12″ 14″ 18″ & 22″ 60-300w

The Ellipse series provides architects and engineers with a basic range of 120 elegant lighting fittings, of slim appearance, which do a first class lighting job. The quality and finish is of the highest order, and the construction without use of screws or levers is simple, effective and foolproof, allowing for easy fixing and maintenance.

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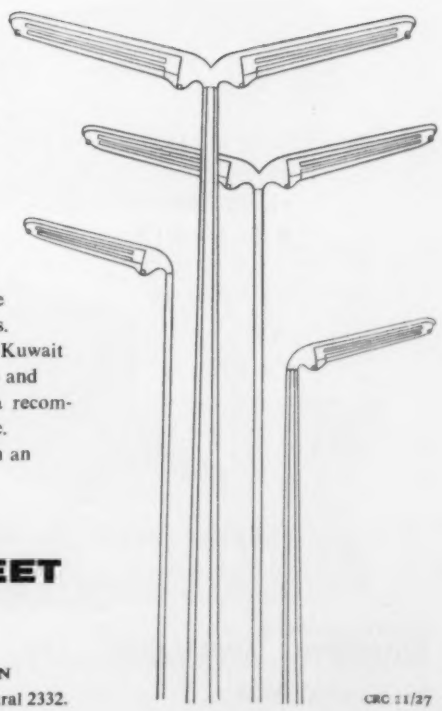
they're looking up and taking notice!

Nowadays people expect increasingly high standards of design in everything that comes into their daily—and nightly—lives. We have developed the Kuwait outdoor lighting system with this fact in mind. It has been approved by the COUNCIL OF INDUSTRIAL DESIGN and adopted by an imposing list of responsible authorities at home and abroad.

The Kuwait Unitary Lighting System provides a comprehensive system of graded sizes and powers for roads of all categories. It is designed around standard interchangeable units and can be adapted and modified at any time, to accord with changes in road or street classification.

Kuwait lanterns are pleasing in appearance, efficient in their use of the available light and easy to service and clean. A single screw releases the perspex bowl for maintenance and relamping. There are single and double-headed versions, and the range of standard head brackets allows the same basic lantern to be fitted to steel, concrete or wood poles and to walls.

Over 40 authorities in the U.K. and many other parts of the world use the Kuwait Unitary system and we thus have considerable experience in its installation and maintenance. For new work or conversions our engineers will provide a recommended layout and subsequently carry out a detailed survey without charge. We are equipped to install as well as supply the equipment and can furnish an estimate for the whole undertaking if required.



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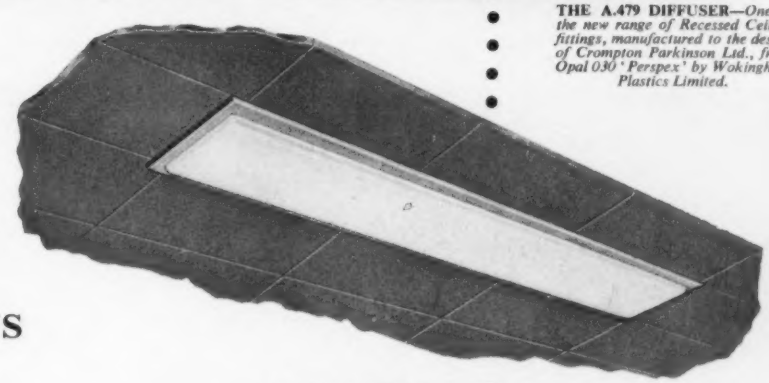
THE A.479 DIFFUSER—*One of the new range of Recessed Ceiling fittings, manufactured to the design of Crompton Parkinson Ltd., from Opal 030 'Perspex' by Wokingham Plastics Limited.*



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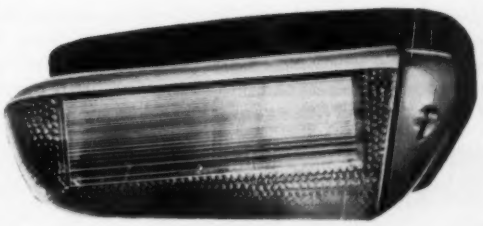
INTERIOR or PUBLIC LIGHTING FITTINGS

Specialization—the constant application of the finest technical knowledge and skill to the job in hand—is the answer to the need for lighting fittings that measure up to modern requirements of maximum dependability, plus fitness for purpose—*and* economy in costs. That is why the Wokingham Plastics Service is more and more in demand by those organisations whose reputation for efficiency is reflected in their choice of equipment.
May we serve you with the same certainty of your complete satisfaction? Get in touch with us NOW.



The New Revo "Sol-Dor" 140 watt Sodium Street Lighting Lantern No. C15154.
This complete Acrylic Bowl is manufactured from Clear and Opal Perspex—the special 'hammered' finish of the Clear portion and the expert machining of the Refractor Panels illustrate the specialised service offered by:—

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WOKINGHAM PLASTICS LTD

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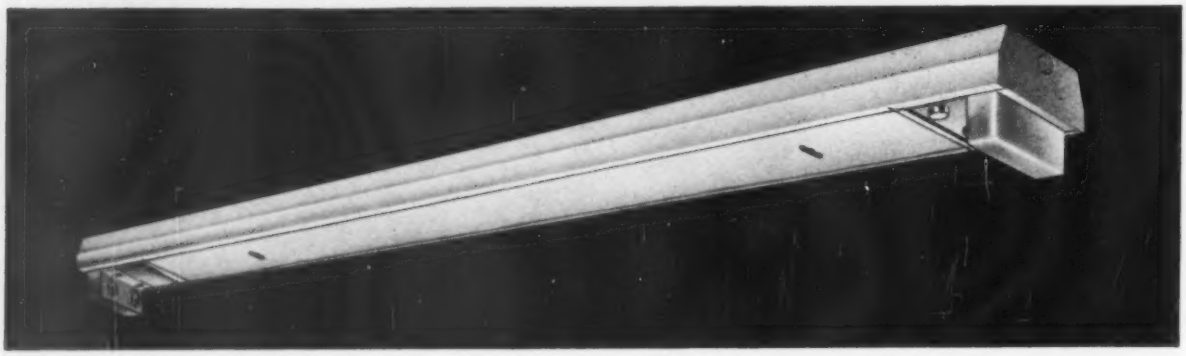
You must see the

* Revolutionary

EKCO Essex Range

PATENT APPLIED FOR

Over 200 Fluorescent Fittings from One Basic Spine



Fittings designed with the User in mind. An entirely new range of fluorescent lighting fittings, produced by experts with many years experience, to combat the ever-rising costs of installation and maintenance.

The **Essex Range** prices are very competitive with those of any fittings of the same standard, but only the **Essex Range** has all the precision built-in refinements such as:—

Detachable control gear tray, quick-fix reflectors and diffusers, heavy duty bi-pin lampholders permitting lamping from one position, no projecting screwheads on spine and many others.

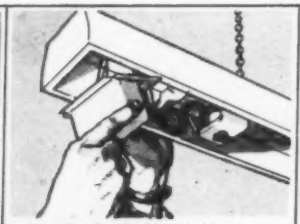
Ask for a copy of the **Ekco Essex Range** Catalogue and see how good fluorescent lighting fittings can be.

- ***Installation and maintenance cost halved.***
- ***Assembly by one man in two minutes.***
- ***Full range of quick-fix metal and plastic reflectors with open or closed ends.***
- ***Modern diffusers with coloured endplates—quickly detachable for ease of maintenance.***

INSTALLATION IS A ONE MAN JOB!

1 *Empty spine easily fixed to conduit, chain, universal suspension or ceiling. The 5ft. spine weighs only 7 lbs.*

2 *Control gear tray hooked at one end into spine, hangs vertically leaving both hands free to make connections. Tray swung into final position and firmly fixed with captive wing nut.*



3 *Ready wired lampholder assemblies slotted into spine. The gear tray and lampholders for the single 80W fitting weigh only 9 lbs.*

4 *Reflector or coverplate attached to fitting by two turn-buttons. Tube(s) inserted into spring-loaded lampholders.*

EKCO **Essex Range**

OF FLUORESCENT FITTINGS

The Economy Range

Another new range by Ekco. If price is your problem, see page xxx

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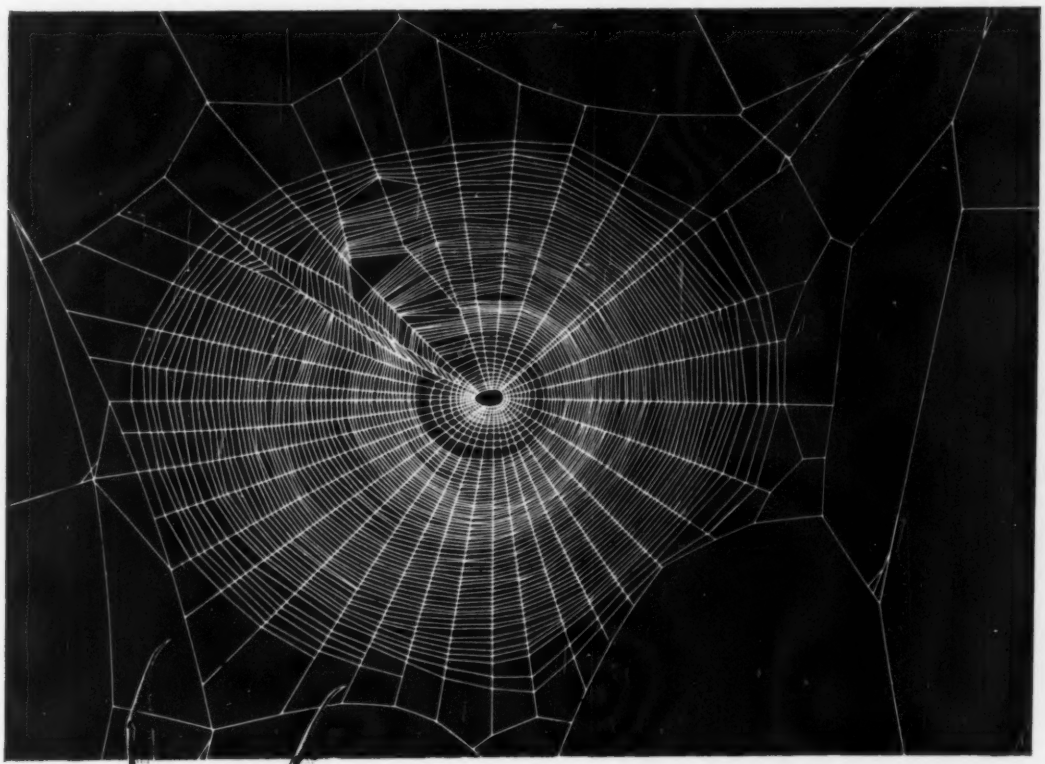
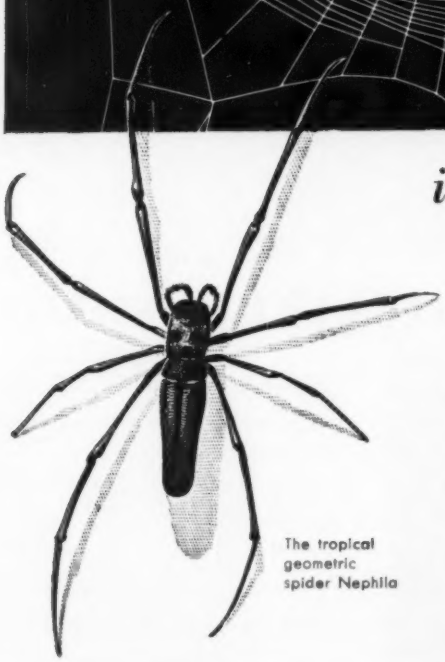




The tropical geometric spider Nephila

it hangs by a thread . . .

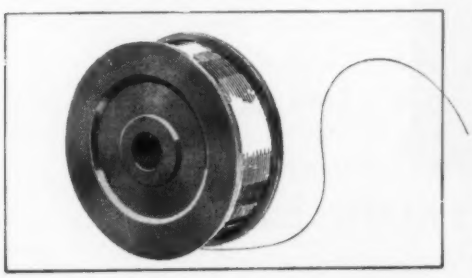
The wonders of Nature are often captivating in both senses of the word. The spider spinning its thin but tough web produces a thread that can hardly be measured. It is roughly 0.275 mils thick!

But the wonders of Nature are surpassed by modern engineering . . . At the Luma Works, the largest Scandinavian producers of incandescent and fluorescent lamps, tungsten and molybdenum wire is produced which, like the spider's thread, is not measurable by normal methods. The finest tungsten wire is only 0.197 mils thick.

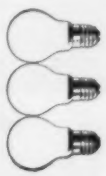
Luma exports 90 per cent of its tungsten and molybdenum wire, and Luma wire is used in radio valves and bulbs in more than 50 countries.

You, too, can get Luma wire in all dimensions and finishes — e. g. black, cleaned or plated, semi-finished rods or finished electrodes.

Write immediately for our new tungsten catalogue in English, French or German.



We manufacture all types of incandescent, mercury vapour, neon and fluorescent lamps, fluorescent fittings and accessories.



LUMALAMPAN AB

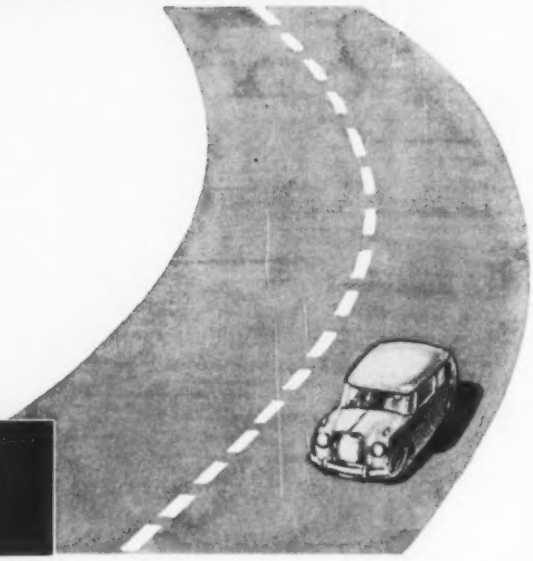
STOCKHOLM 20, SWEDEN
Cables: LUMALAMPAN STOCKHOLM

D

WARDLE "MURRAY"

the leading light for Group "B" schemes

The large and increasing number of municipalities installing the Wardle "Murray" lantern validly proves that the unique Dielikon refractor is an outstanding proposition remarkable for efficiency and unrivalled cost-saving advantages.



UNIQUE DIELIKON REFRACTOR

- ★ *Smooth inner and outer surfaces.*
- ★ *Easy maintenance — three times quicker cleaning.*
- ★ *Unique two-piece moulded construction with sealed prisms of exceptional accuracy for lower absorption and better distribution.*
- ★ *High impact resistance; does not splinter.*
- ★ *170° two-way, non axial distribution.*
- ★ *Single piece, die-cast lantern body, stove enamelled.*
- ★ *Easily adjustable for different lamp sizes.*
- ★ *Lamp rating 100/150/200wGLS: 80/125w MB/U or MBF/U.*

Send for leaflets L36/4 and L36/5.

THE WARDLE ENGINEERING CO. LTD

OLD TRAFFORD, MANCHESTER 16 *Telephone: TRAfford Park 1801 (3 lines)*
London Office: 34 Victoria Street, S.W. 1. Telephone: ABBey 4072 and 1356.

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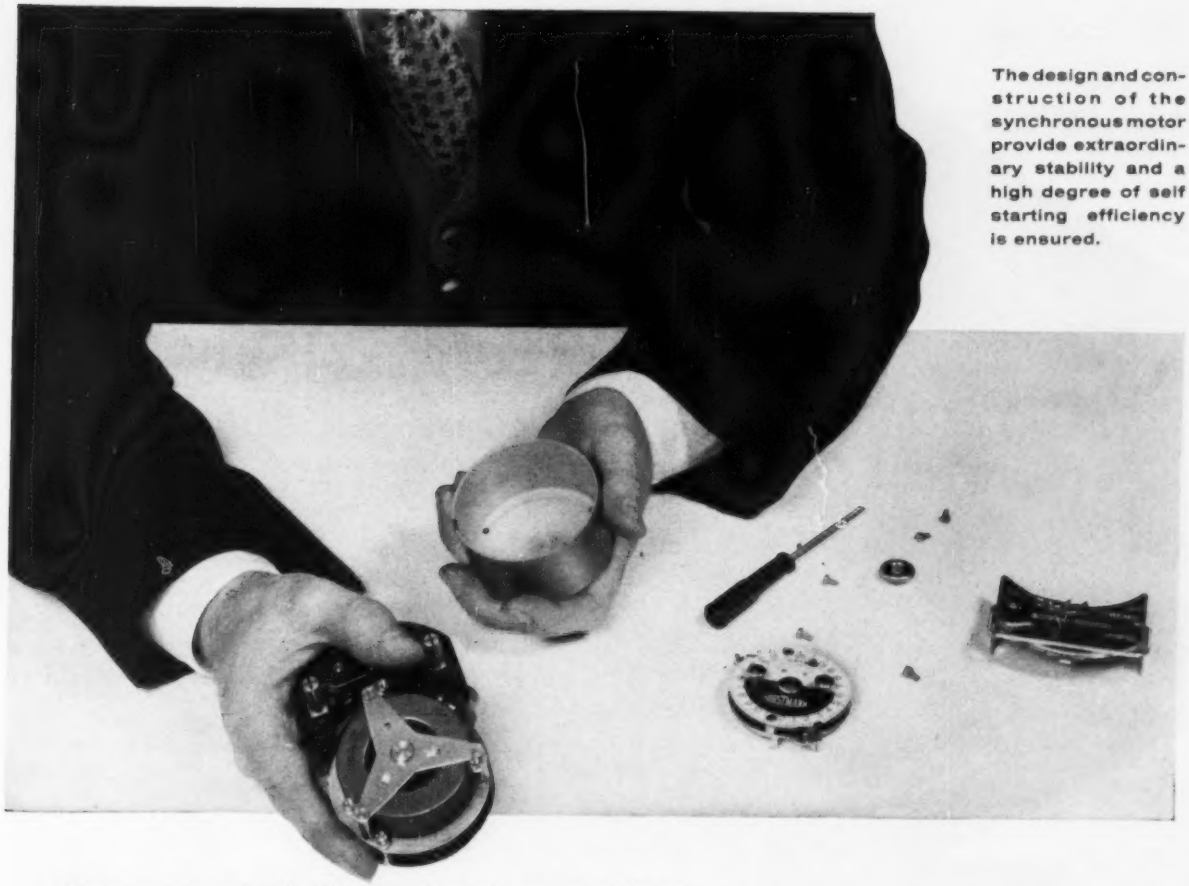

The design and construction of the synchronous motor provide extraordinary stability and a high degree of self starting efficiency is ensured.

The accuracy and reliability you demand are revealed in

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This is the Horstmann Type K Mark II plug-in pattern Time Switch, with synchronous motor driven movement and with switchgear of 20 amps capacity at 200/250 volts, 50 cycles. Models to meet other requirements can be supplied to order.

To meet many different needs, Horstmanns make a large range of Time Switches, but two major requirements are common to all. Time Switches must be *accurate* and they must be *reliable*—able to operate unfailingly under varying conditions of service with scarcely any attention. Horstmanns build these essential qualities into their instruments by employing high grade materials, skilled precision craftsmanship and—half the secret—over 50 years of experience in design and manufacture.

Horstmann Time Switches are used extensively for the control of street lighting, shop window lighting, electric signs, special tariffs —in fact wherever electric current needs to be controlled without human intervention. Such superior instruments compare favourably in price with other time switches but quality has not been sacrificed for cheapness. The best Time Switches are the cheapest in the long run, and Horstmann Time Switches run for a *very* long time.

Full details about all models sent on request.

HORSTMANN TIME SWITCHES FOR CONTROLLING THINGS ELECTRICAL

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Light and LIGHTING

Vol. 51. No. 11. November, 1958

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contents

Public Lighting

AS usual at this time of the year, our pages are devoted mainly to the subject of street lighting. It is hardly to be expected that the general state of street lighting in this or in any country will change radically in the short space of twelve months, but there is, nevertheless, a good deal going on in this field which is of interest and worthy of record. In fact, street lighting design is changing in this country partly owing to the growing use of road surfaces which cannot be suitably brightened by the use of lanterns which were designed for lighting surfaces having different characteristics. On the Continent, there are examples of public lighting that are of considerable interest, and the APLE is to be congratulated upon arranging two sessions devoted to papers by Continental authors at the Association's recent Harrogate Conference. The subject of road accidents and their reduction by better lighting is likely to remain a topical one for a long time, but it is heartening to know—as is reported in this issue—that conclusive evidence of the accident-preventive value of improved street lighting has now been obtained.

Notes and News

DETAILS of the IES Golden Jubilee Commemoration Dinner in London on Monday, February 9th to which we referred last month have now been issued. We were particularly interested to see the names of the speech makers which in addition to the President, Mr. C. C. Smith, include Dr. Don, Dean of Westminster, Sir Charles Wheeler, President of the Royal Academy, Mr. Leslie Gamage, Chairman and Managing Director of the GEC, and Dr. Walsh than whom we can think of no one better to propose the toast to such a distinguished assembly of guests.

We shall look forward to this event both because of its significance in the Society's history and because it promises to be a very good evening.

As we have previously mentioned, the speeches are to be relayed to similar functions in each of the IES Centres on the same evening. If the Centres had any doubts about listening to the speeches from a loud speaker these doubts should be dispelled now that the names of the speakers are known. We understand that there is one other name to be added to the list and that this may be known shortly.

We cannot resist adding that the IES is very much on the ascendant these days. This is due to the wise guidance and forward outlook of those who have undertaken the onerous duties of president or officer during the crucial years since the end of the war. Whilst the Society can continue to call upon such men to serve as Honorary Secretary as J. G. Holmes, who has just retired from that office, and W. E. Harper, who has now taken over, we can rest assured that the IES will continue to go forward.

Lighting Design Data

The Technical Committee of the IES recently published in the IES Transactions (No. 2, 1958) an interim report of its Lighting Design Data Panel under the title "Lighting Design—The Next Step." This interim report is to be discussed at the IES meeting in London on December 9th.

We hope that all practising lighting engineers have studied this interim report. Some may have decided that they needn't bother about it, that it deals with details best left to the experts. Expert guidance on these things is certainly necessary and that is what the LDD panel has provided. But if the panel's recommendations are put into effect then it will concern everyone who makes luminaires and everyone who has to design lighting schemes. It is to be hoped therefore that there would be a good turn-out on December 9th to hear Mr. Robinson's explanation of his panel's recommendations and the ensuing discussion. Just to remind you what it is all about the "next step" envisaged by the LDD panel is the classification of luminaires on the basis of their zonal flux distribution and the substitution of basic interreflection data for empirical data. It involves primarily the refinement of existing data but at the same time it represents a fundamental change in the direction of lighting technique *which has to occur sooner or later.* As we see it we now have the opportunity of discarding the guesswork of the present and establishing a firm foundation on which future lighting design can be built.

For Elegant Design

The Council of Industrial Design announces the establishment of The Duke of Edinburgh's Prize for Elegant Design.

This annual award has been instituted on the initiative and through the generosity of HRH The Prince Philip, Duke of Edinburgh. It will be given for "a contemporary design in current production distinguished by its elegance." Only such products as have been shown in The Design Centre will be eligible for consideration. The winning design will be chosen by an independent panel of four judges appointed at the invitation of HRH The Duke of Edinburgh. His Royal Highness, or his nominee, will act as Chairman of the Panel. The Prize will be given personally to the designer of the chosen product. In cases where more than one designer may be concerned in the product, the manufacturer shall be asked to nominate the one who, in his opinion, has contributed most to its success.

The Prize itself will take whatever form the winning designer chooses provided that it shall not cost more than £100 and that it can carry a suitable inscription. The prizewinner may either design the Prize himself or commission another designer to do so. The COID will arrange for the Prize's manufacture whether by a firm, by a craftsman or, in suitable cases, by a school or college of art.

The Prize will be announced publicly on the occasion of the presentation to manufacturers of the certificates for the COID's selected "Designs of the Year" when the Prizewinner will receive a special certificate, the Prize itself being presented at the same ceremony in the following year, to allow time for it to be made.

Elegant Design?

As the main article in this issue is concerned with the daytime appearance of street lighting installa-

tions we were very interested to see in the American publication *Street and Highway Lighting* an illustration showing an "artist's conception" of how Chicago's State Street will look later this month after the installation of new lighting. The picture is reproduced here. Being a 3rd reproduction the quality of our picture is poor but not so bad that one cannot see the kind of columns and lanterns that are presumably to be used. One must also allow for the original being an artist's impression—we all know what that can mean. Nevertheless we can imagine that some of the COID boys—when they have finished their task in this country!—might consider the possibility of opening a branch in Chicago.

Artist's conception of the new lighting now being installed in State Street, Chicago.

One interesting technical point about the Chicago installation is that it is to be controlled by an automatic radio system supplied by the General Electric of America by which the lighting and extinguishing of lamps will be operated by "beep" signals similar to those emitted by earth satellites. The transmitter will be earth-bound.

Tax Relief on IES Subs

We have been asked by The Illuminating Engineering Society to make it known that the Society has been notified by the Inland Revenue, Chief Inspector of Taxes Branch, that the Commissioners of Inland Revenue have approved the IES for the purposes of Section 16, Finance Act, 1958, and that the whole of the annual subscription paid by a member who qualifies for relief under that Section will be allowable as a deduction from his emoluments assessable to income tax under Schedule E.

Commencing with the year up to April 5th, 1959, a member is entitled to a deduction from the amount of his emoluments assessable to income tax of the full amount of his annual subscription provided that it is paid out of the emoluments of his office or employment and that the activities of the Society are relevant to that office or employment.

Members who are entitled to relief in this way should apply *as soon as possible after October 31st*, 1958, to their tax offices for form P.358 on which to make claims for adjustment of PAYE codings.

Having fulfilled our undertaking to the IES to draw this matter to the attention of its members we may perhaps be permitted to make a comment.

In the first place it will be noted that tax relief is not consequent upon membership of the Society being a condition of employment. The condition is that the member should derive some benefit in regard to his work from membership—and we would think that this applies to every member of the Society who is in what is called "gainful employment."

The effect of this relief (assuming that our arithmetic is right, and we are never quite sure when it comes to income tax never having been able to agree with our own tax collector) is that a corporate member now paying out of his own pocket a subscription of £3 10s. and paying tax at the standard rate will get relief of £1 9s. 9d. so that his membership will now be costing him only £2 0s. 3d. This is less than the subscription was before it was increased a year or two ago.

This is not only a small but welcome help to members but it should also make it easier to get more members.

Lastly, we have heard it said (by someone who shall remain in identifiable anonymity) that presumably tax relief will only be granted if the annual subscription has in fact been paid and that those members who make a habit of paying nearer the end of the year than the beginning will change their habit and pay earlier to make certain of getting their tax relief.

Design by Students

The recent annual exhibition of work designed by students of the Royal College of Art had as one of its objects to show how ties between the college and industry have grown during the last ten years. The majority of things in the exhibition had been designed for production; in many cases prototypes had been made by manufacturers at their own expense, and some of the objects are already in production. It is very encouraging to note that the lighting industry is very actively supporting the college, no less than five firms having made fittings which were shown in the exhibition. We hope to show pictures of these lighting fittings in a subsequent issue.

Improvements in column design and the use of mercury fluorescent lamps leads Peter Whitworth to suggest that elegance may be returning to street lighting. This picture taken recently in Chelsea (see pages 359-360) shows a positive step in the right direction in improving the appearance of tubular lamp lantern installations.

Street Furniture

By Peter Whitworth

Introduction

By Sir Gordon Russell
Director, Council of Industrial Design

IN THE early 19th century, England had the most highly developed road transport system in Europe, made possible by growing skill in vehicle building and road-making. But none of the traffic exceeded a speed of fifteen miles an hour and the heavy waggons moved at a snail's pace. The drivers were mostly professionals who knew every inch of the road in all kinds of weather. Except at lonely cross-roads there was no need of sign posts, for the traveller could always ask his way without dismounting. In the country there was no road lighting and in towns it was thought of as a convenience for the pedestrian rather than for wheeled traffic.

The railways disrupted this pattern, but the motor car has reimposed it in a very different form, bringing a great clutter of street furniture. So essential has it become to deal with the purely practical and economic aspects of lighting roads that the importance of lighting columns as elements in the architectural scene by daylight has been overlooked. Much damage has already been done but there is evidence that the choice and siting of lighting columns and the co-ordination of column and lamp are now receiving considerably more attention.

Mr. Whitworth, who is secretary of the Council of Industrial Design's Street Furniture Panel, has had a good deal of experience in this difficult field and I hope his article will be widely read.

"Those fittings, structures and additions which are not as a rule an integral part of the buildings, carriageway and pavements, yet are necessary in order to perform some public service which may, of course, be obsolescent!"

THIS quotation is Sir Gordon's suggested definition for this term "Street Furniture" which has crept into our vocabulary, and today includes such items as lamp posts, grit and litter bins, parking meters, directional signs, poster hoardings, pedestrian crossings, guard rails, traffic lights, kiosks (police and telephone), fire alarm posts, water hydrants, transformer and relay boxes, bollards, bus shelters and numerous other items that perform or inform. These are sited and erected on the instructions of many people ranging from Government Ministers to the clerk of a parish council all of whom vie with one another to make their objects conspicuous in order that the doings of their department will be readily identified and stand out from their backgrounds. The owners of the backgrounds, especially when commercial interests are at stake, respond readily to the challenge and endeavour to make their "backgrounds" dominate the forest of foreground objects. These are the prevailing conditions in which we have to consider the whole topic of street furniture.

How does the road user who is indirectly responsible for all this chaos benefit? As a motorist he is confronted with complex direction signs at the moment when his attention is required elsewhere, he is flashed and blinked at by coloured lights and beacons often lost in a background of

Fig. 1. An example of accumulation—the clutter that results from haphazard erection of street furniture. This example is not unique—its equivalent can be found in every town. Fig. 2 (right). Even The Mall is unable to escape completely. While it is possible that there is some sensible explanation for this sign, it would seem to be very obscure and the fact remains that it is impossible for the driver of the taxi to see the lettering from his position. Undoubtedly its purpose is to perform the same function as the bollard shown in Fig. 9.

flashing signs and illuminated fascias; to guide and command him are illuminated bollards, black and white stripes both horizontal and vertical, directions at all heights on walls, poles and roadways. All compete for attention until the driver, anaesthetised by these shock tactics, wishes sanctuary when he is confronted by completely unintelligible parking instructions or an equally incomprehensive panel on a parking meter.

Public transport can be just as confusing with derelict shelters left over from the tramway era remote from bus routes. Signs pertaining to the transport system are commonly in poor English and bad lettering. Frames, seldom suiting the route card, all too rarely relate to their support to or anything else. A new bus shelter will have the old pole and sign standing alongside rather than mounted neatly on the structure. Too many shelters resemble something dropped from a lorry on its way to the scrappers yard. Decent litter bins are rarely seen.

The original sole user of the streets cannot escape being regimented in streams, herded by barriers, commanded by lights, obstructed by poles and assaulted by vehicles. Even his convenience is indicated by a yellow sign on an otherwise disused tramway pole, the course often made obscure by the demolition of the historic building which used to support another vital sign. Getting in and out of a telephone kiosk requires observation and strength, mild contortions with a foot in the door are needed if breathing is also necessary. Until recently a fire alarm could only be given by a citizen possessing the courage and physique to shatter what to everyone but small children was unbreakable glass.

To suggest that nothing is being done would be unfair as well as unrealistic; outdated objects are sometimes superseded and replaced by good designs, and occasionally an old one is removed. London Transport have set a good example with both bus stops and shelters, many of their posters give the utmost pleasure. The Post Office—always, it seems, possessed by admirable restraint—is busy with a modernisation plan of its own; the new towns have designed or selected street furniture to relate properly to their environment. The LCC's policy embraces detailed attention to all aspects of design. Industry, slow to start, is now responding with well-designed products and one enterprising manufacturer of lighting columns also offers a bus shelter system and litter bin designed to relate to his columns. Petroleum companies are actively tidying up their sites and house styles. Planners and architects in our towns have proved, by careful selection of good designs and considering the relationship of the various components, that the unity so essential to good townscape is possible. Until such time as a proper policy is determined or a completely unified range of all the items required is available, much can be done by the choice of well-designed equipment having positive merits rather than the ill-conceived with negative shortcomings. Fortunately there is an increasing number of other positive contributions but as yet nowhere like enough to offset the many examples of expenditure of public money on the mediocre where ugliness is accepted as inevitable.

The greatest single aspect of street furniture is undoubtedly street lighting—the interest currently taken by the general public is proof of its importance in a community. The national Press (even those not normally associated with social problems of this kind) give headlines to the common lamp post when their enthusiasm is triggered by the actions of eminent architects or aged actors.

That we must have good street lighting must be accepted, it is no longer merely a question of convenience but one of public safety and it is as essential to our national trans-

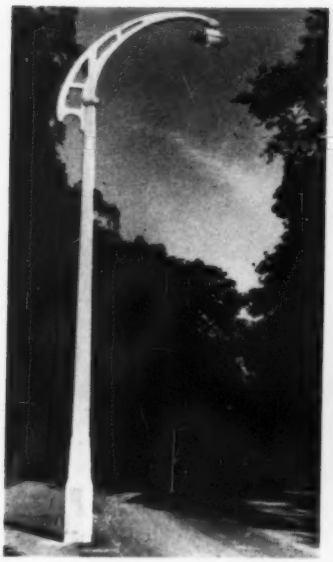


Fig. 3 (left). A concrete column that was in production when the Council of Industrial Design commenced its Street Furniture policy. Fig. 4 (right). Virtually the same requirement as Fig 3, the column having been redesigned and been accepted for inclusion in the COID list. Note the difference in brackets; compare the former lattice work (serving no structural purpose) with the successful detailing at the junction of bracket and column of the later example.

port system as it is to the humblest night traveller. The magnitude of the problem is reflected by the annual sale of lighting columns of about 200,000. It has also been estimated that there are over five million gas lamps to be replaced in Scotland alone. It is not surprising therefore that there is marked competition among the manufacturers of both columns and lanterns. That there are now so many good designs is a credit to the industry but that there are still poor examples produced is inexcusable in the light of the overwhelming evidence of the ugliness they bring into the street picture.

The erection of badly designed columns and lanterns with disregard to qualified advice and the wishes of the residents (who, after all, pay the bill !) cannot be justified and is a serious reflection on the judgment of those responsible for the installation as well as on the wisdom of leaving extremely vital decisions to the engineer and his public works committee. This situation is unfortunately often due to a misguided sense of civic duty and a lack of appreciation of the true requirements.

Because they withstand repeated impact from unfortunate vehicles is no justification for the use of clumsy club-footed concrete street lighting columns and suggests failure to realise that perhaps the siting could be improved to remove an avoidable hazard. Pathetic reproductions in concrete of cast iron columns and fluorescent "period" lanterns are no answer to any problem, let alone the extremely difficult one of fitting new lighting into our old streets ; they have none of the true qualities of the originals and invariably misuse modern production methods and materials. Poor installations using bad columns which originated years ago on the grounds of continuity of a scheme, are likely in reality to be due to reluctance of the buyer to admit the original mistake and to appreciate the great improvement in standards over the last few years.

Columns which tower over village streets reflect the shortcomings of our inadequate road system as well as in the inflexibility of the present Code of Practice which governs our lighting system. The adoption of two standard heights to cover all conditions has proved to be unduly optimistic ; many situations classified as requiring Group A lighting

Fig. 5. Illustrates one of the problems for the column designer. The control chamber must make provision for a fitting that terminates the underground cable. Any of these is likely to be selected!

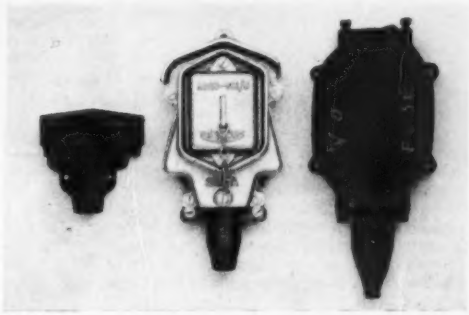
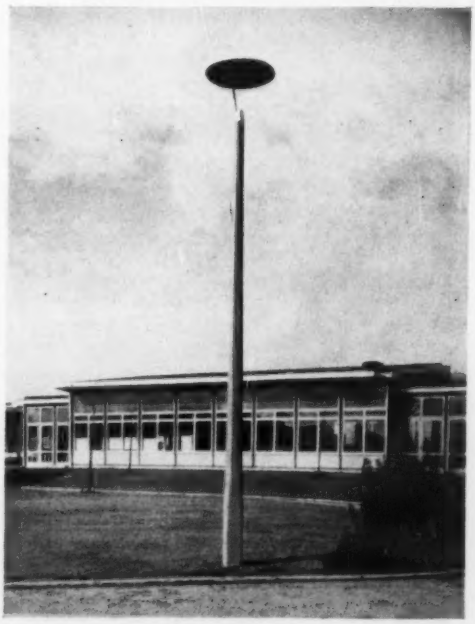


Fig. 6. A good example of the current trend in concrete column design. The slim base dimension has been achieved by reducing the base compartment to take only the smallest gear. A courageous move on the part of the manufacturer anticipating public demand. (Lantern: AEI Orient. Column: Stanton No. 10.)



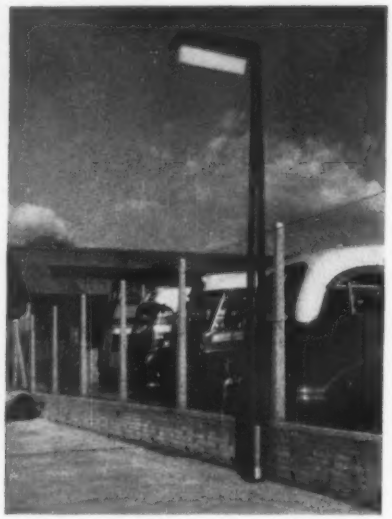


Fig 7 (above). An interesting twin-arm arrangement of one of the few acceptable fluorescent lanterns for Group B lighting, photographed at the L.C.C. Elephant & Castle site. (Lantern: Atlas Beta Two.) Fig. 8 (right). A similar lantern used on a prototype timber column. Fig. 9 (below left). Concrete column with minimum shaft dimensions and an ingenious bracket arm system making provision for a tidy junction with the lantern. The complete lack of relationship between the traffic bollards and column, although they are invariably sited together, is clearly shown. (Atlas Alpha three mercury fluorescent lantern. Eleco-Slim column by Engineering & Lighting Equipment Company Ltd.) Fig. 10 (below right). Although this example is not happily sited, the new steel column is particularly useful in town situations owing to its slim dimensions. The bulk of the fluorescent lantern, however, is emphasised. (GEC column and lantern.)

with its 25 ft. columns really require a mounting height of some 20 ft. or so to avoid ruining a small scale street. There are other places in the town centres where heights up to 40 ft. are suitable and desirable, having been made technically possible by recent developments in lamps, lighting techniques and servicing equipment.

In selecting or designing a lighting column it should be considered as one complete unit consisting of shaft, bracket and lantern and in appearance the resultant lamppost should be either inconspicuous or distinguished. While few of the latter type exist there is an increasing number of slim columns and neat lanterns which can be used with

Fig. 11. Perhaps sited a little close to the tree, this high output unit with lanterns mounted at between 35 and 40 feet in Lucerne, is ideally suited for island locations against almost any background. The cluster of lanterns is visually unified by the mushroom treatment. This increased mounting height results in a more satisfactory proportion of column shaft than many of our own examples. Fig. 12. A new high output mercury fluorescent lantern which shows an obvious economy over the Swiss example, the shape being comp'etely functional. This example although mounted at approximately 30 feet could well be used on even higher columns to good advantage. (Lantern: Atlas Lighting Ltd. Column: Stewarts & Lloyds Ltd.)

advantage in built-up surroundings. In many instances an "invisible" scheme would appear the ideal and much greater use could be made of bracket mounted lanterns or façade lighting which have already been used to great effect in both Groups A and B lighting. Opportunity exists here for an enterprising manufacturer, as the available lighting units make little concession to day time appearance.

Most of the problems encountered in column design have been successfully solved in 25 ft. columns but with few exceptions the 15 ft. column lags behind, particularly so in concrete where the added thickness of material required around the control compartment determines the base dimension. A reduction has been made in the size of gear and compartment but further progress is not possible without the co-operation of the buyer. Insistence by a supply authority or an engineer on the old pattern sealing chamber to terminate the underground cable prevents the universal adoption of smaller control compartments and slimmer column designs. The manufacturers have already reduced the amount of gear to be housed by siting chokes, transformers, etc., in the lantern wherever possible. The use of bulky columns for tungsten lighting, where often the compartment is only part used, could with advantage be avoided. The development of slimmer and cheaper columns could be considerably assisted by the user ensuring that gear, particularly the sealing chamber, is as small as is conveniently possible.

Lantern design, directly related to the size and characteristics of the light source employed, is undergoing a change. The popularity of the colour corrected mercury fluorescent lantern is increasing and gaining favour due to its good colour rendering and small dimensions. These new small lanterns, coupled with slimmer columns, suggest that elegance may be returning to street lighting.

The Council of Industrial Design has been engaged for some years in improving the design standards of all street furniture, particularly lighting columns. In 1952, at the invitation of the Ministry of Transport, its Street Furniture Panel was set up to consider designs of columns to be used on trunk roads and Ministry grants were made conditional on CoID acceptance. By 1954 the number of good designs was sufficient to warrant the publication of an Approved List of Lighting Columns which, with a subsequent revised edition, has been circulated to all local authorities and made available to all interested persons. In the Design Centre in London illustrations of the approved columns (together with other street furniture) are available in Design Index to all visitors.

Through the co-operation of the manufacturers the CoID has been able to negotiate at the design stages and a marked improvement in columns has been achieved. There are now excellent examples of columns in steel, concrete, cast iron, aluminium alloy and timber ; the use of plastics is constantly under consideration and review.

The Royal Fine Art Commission, which formerly performed the functions now undertaken by the CoID, continues to be engaged with problems of siting and selection and many schemes have benefited by its recommendations.

Improvement in the actual lamp-post itself is not enough if it is to be offset by careless or unsympathetic siting—it is essential to see that installations are handled to the best possible advantage rather than accept misuse with complacency. The buyer of well-designed street furniture has an additional gain which should not be overlooked, one good design used with another complements both and the resultant street picture is several times enhanced.

Reduction of Accidents by Improved Street Lighting

By J. C. Tanner*
M.A., F.S.S.

Studies undertaken by the Road Research Laboratory during recent years have produced valuable evidence on the reduction of accidents resulting from better street lighting. A paper by two members of the R.R.L team at the recent APLE conference is reported elsewhere in this issue. This article discusses in detail the data which have been obtained to date.

In a previous article Tanner and Christie[1] analysed accident frequencies before and after the provision of improved street lighting on eight main roads in the London area. They estimated that the frequency of injury accidents in darkness was reduced by an average of 35 per cent; pedestrian accidents showed the greatest reduction, and it was concluded that the monetary cost of the accidents saved was sufficient to pay for the capital and running costs of the new installations.

With the continued co-operation of highway authorities and the police, a large amount of additional information of the same type has now been collected, and this is studied in the present article.

Data and Method

The data refer to 64 lengths of road, or groups of lengths, in various parts of Great Britain. They were re-lit between 1949 and 1955, most of them in 1952, 1953 or 1954. The eight sites dealt with in the previous article have been included.

Most of the roads were previously lit to a poor or fairly poor standard with gas or tungsten lamps. The new lighting in almost every case conforms to the BS Code of Practice for Traffic Routes[2]; most of the installations are of discharge lamps: 140-watt sodium, 240-watt fluorescent or 400-watt mercury.

The accident data for each site refer to periods of up to three years before and after the change, and in a few cases include details of damage as well as of injury accidents. The injury accidents have been analysed by severity (fatal, serious or slight) and by whether or not a pedestrian was injured. Accidents in darkness are separated from those in daylight or dusk. In most cases the "before" and "after" periods are of one, two or three complete years each. In a few cases, however, one period might be two years and the other one year, or each period might be only 6 months. In the latter case the same part of the year would be used before and after.

In analysing the data, the first step was to scale down the figures for the longer period for those sites with unequal "before" and "after" periods. In the case just quoted, the frequencies in the two-year period would be halved and thereafter treated as if they were the actual ones for a one-year period. This procedure is not the most efficient one available, i.e. more accurate estimates of the effect of lighting could have been made by the use of more sophisticated statistical techniques, but the gain in simplicity of analysis is worth this loss.

After simplifying the data in this way where necessary (12 of the 64 sites), it is permissible to add together corresponding frequencies from the various sites. To estimate the average effect of the lighting at a particular group of sites the frequencies are added together and the effect is then measured by comparing the change in the frequency of dark accidents with the corresponding change in daylight accidents, the assumption being made that both sets of accidents were subject to the same influences except for the lighting, which affects dark accidents only. In numerical terms, a quantity r is calculated as:

$$r = \frac{\text{accidents in darkness, after}}{\text{accidents in darkness, before}} \Big/ \frac{\text{accidents in daylight, after}}{\text{accidents in daylight, before}}$$

If r is unity, then the lighting had no apparent effect; if it is less than unity, the lighting apparently reduced accidents in darkness.

This calculation of r may be carried out for various types of accident (fatal, serious, slight, damage, pedestrian, non-pedestrian) and for various groups of sites or for individual sites.

Analysis of Data

The data from all 64 sites were first added together; the totals are given in Table 1 which also gives various sub-totals and ratios. Where the scaling-down processes led to fractional numbers of accidents, these fractions were retained throughout the calculations, although they have been rounded off in Table 1 for simplicity.

The last line but one of the table gives values of r calculated as described above. For injury accidents as a whole, $r = 0.70$, which means that there was an apparent reduction of 30 per cent in accidents after dark following relighting. This reduction is statistically significant at the 0.1 per cent level, i.e. the probability of such a large apparent effect arising solely by chance is less than 0.1 per cent. This confirms the results of the previous investigation, which gave a significant reduction of about 35 per cent.

Damage accidents, in contrast to all the classes of injury accidents, appear to have increased slightly in darkness, although this could be due to chance, the frequencies being rather small. Part of the increase arises from a slight decrease in damage accidents in daylight, which it seems reasonable to attribute to chance rather than to any real general decrease.

For pedestrian accidents the reduction is 45 per cent, and for other injury accidents only 23 per cent. The difference between these two figures, 45 and 23, is not quite significant at the 5 per cent level. It seems very likely, however, that pedestrians really do derive greater benefit from better light-

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Table 1

Accident frequencies at 64 sites before and after relighting

	Pedestrian				Other				Total injury				Damage *
	Fatal	Serious	Slight	Total	Fatal	Serious	Slight	Total	Fatal	Serious	Slight	Total	
Daylight													
Before	5	84	230	319	11	140	778	929	16	224	1,008	1,248	270
After	11	85	238	334	6	159	926	1,091	17	244	1,164	1,425	254
Darkness													
Before	15	52	92	159	13	71	262	346	28	123	354	505	58
After	6	31	54	91	9	59	244	312	15	90	298	403	65
After/before													
Daylight	2.20	1.01	1.04	1.05	0.54	1.14	1.19	1.17	1.06	1.09	1.16	1.14	0.94
Darkness	0.40	0.60	0.59	0.57	0.69	0.83	0.93	0.90	0.54	0.73	0.84	0.80	1.11
r	0.18	0.59	0.57	0.55	1.27	0.73	0.78	0.77	0.50	0.67	0.73	0.70	1.18
Significance level	5%	—	1%	0.1%	—	—	5%	1%	—	5%	0.1%	0.1%	—

* Statistics of damage accidents are only available for a few sites.

ing than do other road users. The more serious accidents show the greatest apparent reductions, but the differences could easily be due to chance.

Consideration of data for individual sites, or groups of sites, rather than data for the set of 64 sites as a whole, was not expected to lead to any firm conclusions since the frequencies that arise are rather small, but there are two points of interest.

Firstly, the lighting may have had a greater effect at some sites than at others, without specifying in advance any particular group of sites that might differ from the rest. Evidence on this point is given in Table 2, which shows the value of r for 13 individual sites where the number of injury accidents in darkness was greater than 20 in the "before" and "after" periods combined, and for the remaining sites divided into 10 groups with at least 20 dark accidents per group. Firstly, it may be noted that r is less than unity (i.e. dark accidents were reduced) in 18 of the 23 cases; this confirms that the overall reduction (30 per cent) can hardly be due just to chance. Secondly, the variation in r is greatest for those sites where the numbers of accidents are the smallest. This suggests, and detailed calculations have confirmed, that the scatter among the values of r is largely, if not almost entirely, due to the smallness of the accident frequencies rather than to real variations between the effects of the lighting at different sites. Thus, while there are, no doubt, some sites where particularly large or small effects occur, it may be concluded that at the majority of sites where traffic-route lighting is installed the true reduction in injury accidents is not far from 30 per cent.

The second way in which it is useful to break down the set of 64 sites is by the type of lighting provided. For damage accidents and for new tungsten lighting the accident frequencies are too small to be meaningful, but Table 3 shows the values of r for injury accidents at sites provided with discharge lighting. All three types of discharge lighting show significant decreases; these vary from 25 to 39 per cent. However, there are no significant differences between these three values of r; the difference between the 25 per cent for sodium and the 39 per cent for mercury could easily have occurred by chance if the true effect on accidents were the same for both types. Thus, although greater amounts of

Table 2

Values of r for injury accidents at individual sites or groups of sites
(Each r is based on at least 20 dark accidents)

Value of r	Number of sites or groups			
	20 to 29 dark accidents	30 to 39 dark accidents	Over 50 dark accidents	All
0.1–0.2	1	—	—	1
0.2–0.3	—	—	—	0
0.3–0.4	—	—	—	0
0.4–0.5	—	2	1	3
0.5–0.6	—	1	—	1
0.6–0.7	4	—	2	6
0.7–0.8	—	1	2	3
0.8–0.9	1	1	1	3
0.9–1.0	—	1	—	1
1.0–1.1	1	1	—	2
1.1–1.2	1	1	—	2
1.2–1.3	1	—	—	1
No. of sites or groups	9	8	6	23

Table 3

Values of r for injury accidents, by type of lighting provided

Type of lighting	Value of r	Significance level
Fluorescent	0.71	5%
Mercury	0.61	0.1%
Sodium	0.75	1%

Note: The three values of r do not differ significantly from each other.

data might show one type of lighting to provide greater benefits than others from the safety point of view, there is at present no evidence to suggest that this is so.

Economic Benefits

Omitting seven sections of unknown length, there were 64.5 miles of road included in the investigation. On this mileage, injury accidents were occurring at a rate of 233 per year in darkness after relighting. Therefore, if the roads had not been relit they would have occurred at a rate of about 233/0.70, or 333 per year. Thus 100 accidents per year were being prevented by relighting, or 1.55 per mile of road per year. According to Reynolds[3], the average monetary cost of an injury accident was £332 in 1952, which is equivalent to about £454 at 1958 price levels (scaling up in proportion to the Index of Weekly Wage Rates). This excludes any allowance for suffering; it includes only such items as medical expenses, vehicle repairs and administrative costs. Hence, at current prices, the relighting of the roads studied reduced accident costs by about 1.55 x £454 = £704 per mile of road per year.

The total annual cost (including capital repayment) of the new lighting is about £800 per mile at current prices, so that after allowing for the savings on the old installations, the increase in the annual cost is less than the monetary cost of the accidents saved. Thus the improvement of the lighting is fully justified on economic grounds alone. Such calculations cannot, of course, take into account the humanitarian aspect of the accident saving, nor the other benefits of better lighting.

Conclusions

(i) The new data confirm earlier work which showed that the provision of good modern street lighting usually reduces the frequency of injury accidents in darkness. The old and the new data combined give an average reduction of 30 per cent.

(ii) There is fairly strong evidence that the reduction in pedestrian accidents is greater than the reduction in other types of injury accident.

(iii) No conclusions can be reached as to the effects on accidents of different severities. The greatest apparent reductions were for fatal and serious accidents, while damage accidents appeared to increase, but the differences between these effects could have been due to chance.

(iv) There are no significant differences between the accident reductions for fluorescent, mercury and sodium installations.

(v) The savings in accident costs are more than sufficient to pay for the increase in the capital and running costs arising from the new installations.

Acknowledgments

The Laboratory is grateful to all those highway authorities and others who supplied the information on which this article is based, and to the Metropolitan Police for providing access to their accident records. The article is published by permission of the Director of Road Research.

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A.P.L.E. Conference

Report on the proceedings of the annual conference of the Association of Public Lighting Engineers at Harrogate.

THE annual conference of the Association of Public Lighting Engineers was held this year at Harrogate from the 16th to the 19th September. The meetings were held in the Royal Hall and, as usual, there was an exhibition of street lighting apparatus and equipment in the annexe and the adjoining grounds.

The opening ceremony on Tuesday morning was performed by the Mayor of Harrogate, Councillor B. H. Wood, T.D., J.P., who welcomed the Association and spoke appreciatively of its work in improving the standards of public lighting up and down the country. He added that during a recent flight at a low altitude over a large area, he had been struck by the fact that, in general, inter-urban roads were unlighted. He felt that to reduce accidents it was just as important to light these roads as it was to light city streets and he urged the APLE to give its attention to this matter.

Mr. H. Carpenter, who was retiring after a second consecutive year of office as president, expressed the thanks of the Association to the Mayor and gave a welcome to the Lord Mayor of Coventry, who also was present. He then went on to welcome a number of visitors from overseas and to speak appreciatively of the work of Mr. T. Wilkie, a founder member of the APLE, and of others with long records of service to the Association, who would be retiring before the next Conference.

After Mr. Granville Berry, City Engineer and Surveyor of Coventry, had been inducted as the new President, it was announced that Mr. R. Parker, Superintendent of Lighting for the City of Aberdeen, had been elected Vice-President and that the next Conference would be held in Aberdeen from the 15th to the 18th September, 1959. A vote of thanks to Mr. Carpenter for his services during the past year was carried by acclamation.

The Presidential Address

Mr. Granville Berry then delivered his Presidential Address. He said that, since the formation of the Association some 35 years ago, there had been phenomenal developments in street lighting. Much of the lighting at that time was of use only to the pedestrian or served to indicate particular dangerous places along a road; today, with over 7 million motor vehicles on a road system still largely unchanged, and with more than a quarter of a million people killed and injured on the roads every year, the lighting needed to be sufficient to ensure the safe movement of both pedestrians and vehicles. The development of new light sources and the establishment of the principles of lighting to produce a high road-surface brightness, paved the way for the Departmental Committee's Report in 1937, but then came the setback due to the second World War.

Since 1946, however, local authorities and the lighting industry had collaborated to relight over 5,000 miles of traffic roads at a cost of nearly £20 million, until today there were about 1½ million street lamps in nightly use in Great Britain, which enjoyed the best lighted road system in the world.

Mr. Berry remarked that street lighting was a subject of international concern. Codes of practice had been introduced in several countries, notably France, Germany, the USA and the USSR. It was one of the matters discussed at meetings of the International Commission on Illumination, while at the First International Congress of Municipal Engineers, held recently in Brussels, street lighting was one of the subjects on the agenda and he had had the honour of being invited to report on recent development in Great Britain and in Continental countries.

Road Accidents and Road Delays

In 1957, said Mr. Berry, there was an all-time record in the number of accidents on the roads and the accident rate continued to be higher in the winter months, although it was becoming increasingly apparent that night accidents were not only a winter problem; they were rapidly increasing during other months of the year. The total cost of reported accidents was in the neighbourhood of £170 million a year and it had been clearly demonstrated that there was an economic justification for the provision of modern street lighting on our traffic roads.

Then there was the cost of traffic delays. It had been estimated that this amounted to nearly £500 million a year and the Road Research Laboratory had indicated that an increase in speed of only one mile per hour on roads in urban areas would probably save nearly £30 million per year on present traffic. The provision of improved lighting, said Mr. Berry, was the most economical means of improving traffic flow at night and reducing the number of accidents.

Motorways

Turning to the subject of motorways, Mr. Berry said that there seemed to be much justification for providing lighting for the whole length of the road and not only at junctions and approaches. The cost of such lighting would be unlikely to exceed £4,000 a mile for dual carriageway roads, an insignificant figure when compared with the cost of the road itself or the cost of accidents likely to be prevented. For these reasons the Council of the Association had asked the Ministry of Transport to give consideration to the continuous lighting of motorways and to the possibility of its installation, experimentally, on the Preston By-pass, where the Minister was seeking to get first-hand experience of the use of motorways and the effect of absence of speed limits.

The important part played by road surfaces in lighting schemes was well recognised both in this country and abroad, and at the Brussels Congress, to which he had

already referred, it had been urged that the engineers responsible for constructing roads and those who had the task of lighting them should get together at the design stage.

Administration and Finance

It had long been evident, said Mr. Berry, that in street lighting the administrative and financial sides had lagged behind the technical achievements of the industry and the lighting engineer. The matter had been raised in both Houses of Parliament, and in his reply to the debate in the Commons Mr. Nugent had shown a very sympathetic understanding of the difficulties facing local authorities.

Finally, Mr. Berry referred to the subject of co-ordination between neighbouring authorities and the "Practice Notes" recently issued by the Metropolitan Boroughs Standing Joint Committee. Looking to the future, he said that there was a definite trend towards higher levels of illumination and greater mounting heights in urban areas. More and more lighting engineers would be needed to deal not only with street lighting but with all the other forms of public lighting for which local authorities were responsible.

Lighting for Prestige and Tourism

While in the morning the emphasis had been on the safety and convenience which resulted from good street lighting, in the afternoon Mr. L. C. Kalff, of Eindhoven, talked about other matters, as will be evident from the title of his paper, "The Lighting of Towns for Prestige, Propaganda and Tourism." He said that just as there was little uniformity in street lighting, even after 50 years of experience, so with other applications of light in towns development had been very haphazard. Up to the present artificial light had only rarely been conceived from the start as part of the architecture and town planning. Nevertheless, Mr. Kalff expressed his conviction that slowly but surely artificial lighting installations would be integrated with the architecture of important buildings, so that on festive occasions these buildings could be set ablaze with light which was seemingly part of the structure. He had some disparaging remarks to make about the lamp posts which had disfigured Regent Street where, on special occasions, temporary and expensive decorative lighting was installed.

It had been the aim at the Brussels Exhibition to rely on the exterior illumination of the pavilion to provide the lighting of the roads and the surrounding areas, but in many cases the architects had failed to pay sufficient attention to this matter. The Austrian pavilion was a brilliant exception, and Mr. Kalff showed slides of this and some other pavilions where the original intention had been carried out. He also showed some examples of city streets where the exterior lighting of the buildings helped materially with the illumination of the highway.

Since the war a very remarkable development had taken place, creating a new attraction for tourists. *Son et lumière* originated at Chambord in 1952; now there were more than 100 such shows in France and in most cases not only was the rather costly installation paid for in one or two years, but there was often a large surplus to be devoted to the restoration of the palace or castle concerned. The popularity of these spectacles did not seem to diminish in spite of their number. The staging of a light and sound spectacle in a built-up area presented certain problems, but by using the inner courts of historic buildings (as at Paris, in the Invalides) it was possible to admit a paying audience and keep the sound sufficiently isolated to prevent it from disturbing people living in the vicinity. There were now installations in Belgium, England, Italy and Portugal, while others were being planned in Austria, Holland and Spain. Mr. Kalff said that such spectacles did not always need a large building in order to be successful.

He then showed some examples of lighting for prestige where not only floodlighting, but new and striking methods of street lighting had been employed. In particular he mentioned the lighting installation in the station square at Rotterdam and at the conclusion of his paper he demonstrated the new 10-kW high-pressure xenon discharge lamp giving 250,000 lumens, which might well find an application for purposes such as this.

The discussion was opened by Mr. H. Hewitt, who said that while British public lighting engineers were legitimately proud of what they had achieved in street lighting, when it came to lighting for prestige this country made a very poor showing. It was not that the equipment was not available, but there had been little opportunity to use it. Last year we had had two light and sound spectacles; this year there were six, but it still could not be said that the idea had really caught on. There was still a preference for floodlighting, probably to a large extent for financial reasons.

Mr. J. T. Grundy thought that much of the street lighting in large towns today was for prestige and for the convenience of pedestrians; a great deal of vehicular traffic tended to by-pass the towns. He pleaded that the street lighting in a town should be designed as part of the town plan.

In his reply, Mr. Kalff said that fluorescent lamps were not much used in *Son et lumière* productions as it was often easier to obtain the desired effects by means of tungsten lamps.

Proposing a vote of thanks to the author, Mr. F. C. Smith mentioned the extensive display in 1931 which had done so much to popularise floodlighting in this country. He felt that a debt of gratitude was due to those who had made possible the remarkable developments illustrated by what Mr. Kalff had described and shown on the screen during the presentation of his paper.

The Annual Luncheon

On Wednesday the annual luncheon was held in the Majestic Hotel, with the President in the chair. The toast of the Borough of Harrogate and the Guests was proposed by the Vice-President, Mr. R. Parker, who expressed the Association's pleasure at having with them the Mayor and Mayoress and a number of the Borough officials, as well as representatives of the Area Boards. He then went on to welcome the principal guest, Mr. G. R. H. Nugent, Joint Parliamentary Secretary to the Ministry of Transport, Lord Derwent, Chairman of the British Road Federation, Sir Gordon Russell, Director of the Council of Industrial Design, and the Lord Mayor of Coventry.

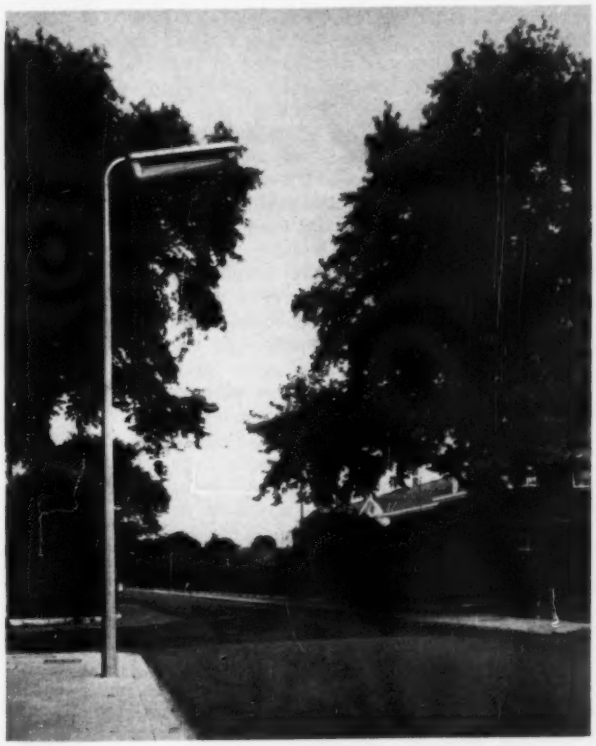
After the Mayor had responded to the first part of the toast and Lord Derwent had replied for the other guests, Mr. Nugent proposed the toast of the APLE. He congratulated the President and the Association on the success of their efforts to impress upon those in high places the necessity for and the advantages of good street lighting, and referred to the centuries-old cry of "Who goes home?" which still marked the end of a sitting of the House of Commons and was a reminder of the days when there was no street lighting and going home was a hazard better faced in company than alone.

He spoke of the desirability of agreement between neighbouring authorities with regard to street lighting schemes and mentioned that recently the Ministry of Transport had called a meeting of representatives of over 100 local authorities in the Greater London area. As a result, a co-ordinating committee had been appointed to explore the whole matter. He mentioned also the country-wide survey of street lighting now being undertaken by the Ministry.

(continued on page 361)

RECENT STREET LIGHTING INSTALLATIONS

Chelsea



A new street lighting system, comprising over 400 lanterns each housing three 5 ft. 80-watt fluorescent tubes is now installed along all the main roads in the Metropolitan Borough of Chelsea. The contract included the supply of GEC octagonal tapered steel columns, lanterns, gear and lamps, and the erection.

For the main shopping streets, the Council has used 388 of the new GEC tapered "Three-Eighty" fluorescent lanterns carried at 12½° above the horizontal on a special arc bracket. This method of mounting was adopted at the suggestion of the Borough Engineer, Mr. E. G. Goldring. It is proving so successful from the lighting and appearance points of view that the GEC is now marketing a special angle bracket. Light output from the lantern is controlled by machined "Perspex" refractor plates (see page 372).

The last stage of the relighting programme involved part of the Thames Embankment, one of the high-density traffic routes from London to the south-west. It is heavily tree-lined and is lighted by "Three-Eighty"

Chelsea (continued)

cut-off lanterns suspended centrally on catenaries carried on octagonal tapered steel columns. The columns are designed specially to carry a 48 ft. span, the load of the lanterns which weigh 75 lb. each.

The erection of the complete installation confronted the GEC mobile erection squad with some unusual problems. Trial holes had to be dug at every position in the Borough where a column was to be sited. The excavations revealed a large number of underground obstructions including sewers, ducts, cables and under-pavement cellars, and it became evident that a large number of special roots would have to be constructed. Drawings were produced on site and, to clear the obstructions, about 60 cranked roots of different shapes were required. Where cellars caused obstruction, over 60 raft roots had to be supplied ; this work involved laying a thick bed of concrete over each cellar and fitting a steel plate to the base of each column, by means of which the column was bolted down on the concrete.

The day views on page 359 show (top) Royal Hospital Road (bottom) Chelsea Embankment. The night-time views on this page are (top) from Sloane Square, (bottom) Kings Road.

In reply to the toast the President expressed the Association's gratification at what the Ministry was doing and spoke appreciatively of Mr. Nugent's share in it. He reiterated some of the suggestions he had made in his Presidential Address and concluded with a tribute to the work of the Council of Industrial Design.

Street Lighting, Traffic and Safety

The effect of good street lighting on safety is a matter about which much has been said and written from a commonsense point of view, but really convincing evidence has been very difficult to obtain. Readers of *Light and Lighting* will remember the paper on this subject read at the CIE meeting in 1955 by J. C. Tanner and A. J. Harris, of the Road Research Laboratory. Their work has been continued and at the session on Thursday morning two of their colleagues, A. W. Christie and R. L. Moore, presented a paper entitled "Street Lighting from the Point of View of Traffic and Safety," the first part of it dealing with the effect of Group A street lighting on safety. An analysis made by Tanner of the accident statistics for 64 sites at which Group A lighting had been installed in place of lighting to a lower standard, showed a significant drop in the night accident rate. (An article by Mr. Tanner appears on pages 353-5 of this issue.)

A convenient figure to use for making the comparison is the ratio of night accidents to daytime accidents, and it was found that for pedestrian accidents this ratio fell by 45 per cent while for all accidents it fell by 30 per cent.

Further evidence of the good effect of Group A lighting was obtained from the accident statistics for main roads in 47 towns where the necessary figures were available. The night/day accident ratio for main roads with average Group A lighting was compared with that for roads with poorer lighting. The ratio was 29 per cent less in the case of pedestrian accidents and 18 per cent less for all injury accidents.

The suggestion that improved street lighting failed to make streets safer, because it tempted drivers to higher speeds, was disposed of by an actual survey which showed an almost insignificant increase of speed but again a significant decrease in the accident rate.

Improved Group A Lighting

In the second part of the paper the authors suggested that Group A street lighting might be made still better if the characteristics of modern road surface materials were taken into account. They pointed out that the Code of Practice was largely based on the recommendations of the Departmental Committee which had reported over twenty years ago when road surfaces tended to be a good deal more shiny than they were now. The consequence was that the high-angle distribution no longer possessed the advantages which it then enjoyed, as it failed to make the surface of the roadway sufficiently bright to overcome the glare caused.

A specially designed portable photometer had been used to study the reflection characteristics of road surfaces for the special condition of 85.7° incidence and reflection. The luminance of the surface under these conditions, when expressed as a multiple of the luminance of a perfectly diffusing white surface under similar conditions, was termed the "glancing angle luminance factor." For the compressed rock asphalt formerly much used this factor was 210, while for modern bituminous sand carpet it was 6. The loose correlation between the skidding resistance of a surface when wet and the glancing angle luminance factor when dry was strikingly shown by means of a diagram.

The prevalence of non-skid surfaces, then, meant that it was necessary to cater for a comparatively low luminance factor, with much diminished areas of high brightness on the roadway. This had two consequences. In the first place it was undesirable to use high-angle distributions, while at the same time more light should be incident on the roadway.

Based on this analysis, the authors put forward specific recommendations for maximum spacings on roads of different widths. While a spacing of 120 feet could be used on a narrow road (24 ft.), for a road 42 feet in width the spacing should be reduced to 69 feet, although this could be raised to 82 feet if the mounting height were increased from 25 to 30 feet.

Closing in the columns created certain problems as regards siting. In particular, while it was not certain whether siting near the edge of a crowded pavement had a bad or good effect on accident-causation, there was little doubt that on more open roads with no footpaths or very light pedestrian traffic, columns should be set back as far as possible.

Returning to the subject of road surfaces, the authors said that some improvement in the reflection characteristics could be brought about by the use of light-coloured aggregates at only slightly increased cost.

Low-cost Lighting for Traffic Routes

Some experiments on the lighting of main traffic routes outside built-up areas were described in the third part of the paper. About half a mile of the Colnbrook By-pass was lighted in November, 1956, by means of a system costing about half as much as normal Group A lighting. Cut-off lanterns, with a 400-watt mercury lamp, were centrally suspended at a height of 25 feet and a spacing of 270 feet and it was found that after the installation was switched on, more than half the drivers used only their sidelights. A census of opinions indicated that although the system met with unqualified approval from 55 per cent of drivers, 22 per cent expressed unqualified disapproval. From an accident analysis it appeared that there had been a reduction of about 25 per cent in the number of night accidents, but the numbers were not large enough to enable a reliable estimate to be formed. It was concluded, therefore, that the system could not yet be recommended for general adoption on main roads outside built-up areas.

Road Surfaces

Mr. H. C. Weston, Chairman of the Street Lighting Sub-Committee of the Road Research Board, opened the discussion with a backward look at the paper read before the APLE in 1954 by Harris and Christie. Then the authors had drawn some tentative conclusions and now these had been confirmed by the much fuller information obtained in the intervening period. Remarking that in other fields of lighting the values of illumination recommended and commonly provided had shown a continuous increase, he wondered how far the similar tendency in street lighting would be likely to go. The reflection characteristics of road surfaces were of vital importance to the street lighting engineer and the Road Research Laboratory had in preparation a handbook which would provide this information. The experimental installation described in Part III of the paper was to be extended, so that more definite conclusions could be arrived at without undue delay. Personally, he had found it much more comfortable for the driver than an unlit road.

Mr. H. R. Ruff emphasised the importance of the road surface, which, he said, was the most troublesome single factor which the lighting engineer had to take into account. On the subject of motorways he pointed out that for travelling at high speeds a driver needed headlights of extremely high intensities. If, therefore, the greatest use was to be made of these roads, they would have to be

lighted throughout. Mr. Howard Cope criticised the experimental installation. He thought the continual alternation of dark and light patches would become distressing; in any case, the system would not be suitable for a winding road.

Mr. F. Widnall felt that better results could probably be obtained by the use of specially designed fittings, while Mr. L. C. Rettig said that the visual effect of an installation depended on the relation between the road-surface brightness and the brightness of the fittings. He asked why the opinions of trained observers had not been taken rather than those of casual motorists. Dr. Ballin asked whether, under wet conditions, modern road surfaces were better or worse than those formerly used.

Mr. J. G. Holmes said that it was largely due to improvements in road surfaces that the rise in the accident rate was slower than the rise in the number of vehicles on the road. The Code of Practice perpetuated values of light flux originally laid down in 1937, but if since then the luminance factors of road surfaces had fallen to one-quarter or less, surely the number of lumens should be multiplied by four. He deplored a recent tendency to reduce the extent to which the light from the source was optically controlled. Mr. E. R. Knight remarked that when the road surface was wet the larger the flashed area of the fittings the better.

Mr. Christie, in reply, said that the handbook mentioned by Mr. Weston was still in the early stages of preparation. Answering some of the questions asked, he said that the running-cost of the experimental installation was about one-third that of Group A lighting. The opinions of trained observers were sometimes less valuable than those of a casual observer, because they were sometimes biased by the training itself and by previous experience. On the point raised by Mr. Holmes, he said that the big reduction in the luminance factor occurred only at large angles of incidence and reflection, not under all conditions, so that it was not correct to assume that the total light required was four times as great.

A vote of thanks proposed by Mr. E. C. Lennox was carried by acclamation.

Street Lighting Abroad

On Thursday afternoon delegates assembled for an "International Symposium" of four papers by distinguished lighting engineers from overseas. The first speaker was Mr. A. Boereboom, who first summarised progress in public lighting in Belgium during the past few years. Standards, he said, had risen noticeably, chiefly due to the use of more powerful lamps in substitution for those of lower wattage. For example, 140-watt sodium lamps were used instead of 85-watt lamps, while 250- and 400-watt colour-corrected mercury replaced the 80- and 125-watt ratings; even in the case of fluorescent, 65-watt lamps were being used in place of the original 40-watt. Mounting heights of 10 to 12 metres were commonly employed to reduce glare and to distribute the light more uniformly over the carriageway.

The issue of a Code, said Mr. Boereboom, had been followed by noticeable improvements, as those responsible for lighting schemes were coming more and more to follow its recommendations. There was a growing tendency for streets in towns to remain lighted all night, thanks to the reduction in the price of current. There was significant progress to record in the lighting of rural areas.

Except where tubular fluorescent lamps were used, fittings were usually of the open type and of polished anodised aluminium; the tendency was to prefer a cut-off distribution.

Mr. Boereboom then went on to describe the modernisation of much of the street lighting in Brussels for the 1958 Exhibition. This covered the outer and inner ring roads, the tunnels constructed to facilitate the flow of traffic, the great viaduct, nearly a mile long, and a number of cross-roads and roundabouts. For the inner ring road tubular fluorescent lamps were used at a mounting height of 30 to 33 feet and a spacing of about 81 feet. This system gave a very even distribution of light, the minimum illumination being 0.7 lm/ft^2 and the maximum 1.8 lm/ft^2.

The lighting of the tunnels was described by the author in considerable detail. Tubular fluorescent lamps were used in continuous lines, the number of lamps being considerably increased towards each end so that at a tunnel entrance the illumination was 60 to 70 lm/ft^2.

The viaduct had no lighting in the ordinary sense; instead each of the three traffic lanes was bordered on either side with a series of luminous lines indicating the limits of the lane. Traffic lights were suspended over each lane so as to give independent control of the traffic in that lane. Thus, for example, one lane could be used for traffic in one direction and the other two for traffic in the opposite direction, or this arrangement could be reversed, according to the needs of the moment.

The lighting of the outer ring roads was by sodium lamps, each lantern carrying one or two of the 140-watt rating mounted at 29 feet and giving an average illumination of 0.6 lm/ft^2 on the fast traffic lanes, 0.4 lm/ft^2 on the local traffic lanes and 0.8 lm/ft^2 on cross-roads.

At certain cross-roads the traffic signals could not be placed at the edge of the road, so in order to avoid central suspension, light metal posts with an outreach of up to 24 feet were used.

A Code and a Text-book

The second speaker, also well known to lighting engineers in this country, was M. L. Gaymard, the chief public lighting engineer to l'Electricité de France.

Readers of *Light and Lighting* may remember the French Recommendations for Street Lighting, published some time ago and reviewed in this journal in June 1950. This publication was a comparatively short document and, as M. Gaymard pointed out, some of it had become out of date. Further, there was in France no text-book corresponding to Waldram's treatise on the subject. For these reasons the various trade and professional associations concerned, in collaboration with the French Electricity Authority, had set up a committee which recently produced a very detailed and lengthy "Code of Good Practice in Public Lighting and Illumination." This book of some 550 pages, said M. Gaymard, was lavishly illustrated because it was hoped that it would be read, not only by engineers and road surveyors, but also by those members of local authorities specially concerned with street lighting matters. More than half the book, indeed, consisted of photographs, sketches and working diagrams.

In his paper M. Gaymard summarised the contents of the Code as far as could be done in seven pages. A short introductory chapter on the benefits of good street lighting was followed by one on definitions and units. Chapter III described the principles underlying good visibility on the road, with particular reference to the reflection characteristics and luminance of road surfaces. Chapter IV, a very important one, made definite recommendations for the arrangement of lanterns, their heights and spacings, and for the illumination of the roadway.

Here the author was at pains to point out fundamental differences between the French and the British codes. The latter recognised only two categories of highway, traffic

(continued on page 364)

RECENT STREET LIGHTING INSTALLATIONS

Newmarket

A section of the main London to Norwich road north of Newmarket relit earlier in the year by the Newmarket Urban District Council using Atlas " Alpha Two " fluorescent lamp lanterns.

Kuala Lumpur

A shopping centre in Kuala Lumpur, Malaya, lit by AEI " Sapphire " 250-watt mercury lamp lanterns.

routes and other roads. In the French code, on the other hand, there were five categories. Again, whereas the British code provided for only two mounting heights, in the French code the recommended height was related to the road dimensions, mainly the width. Chapter IV contained also practical advice on the lighting of curves, roundabouts, tree-lined roads (very numerous in France) and parking areas.

The next two chapters were concerned with shopping areas and the lighting of parks, statues and fountains. *Son et lumière* presentations were dealt with in Chapter VII, while bridges and tunnels respectively formed the subjects of Chapters VIII and IX. The latter was lengthy, partly because tunnel lighting was a very complicated matter, and partly because of the great interest now being taken in it.

To complete the section of the book dealing with problems of interest to public lighting engineers there was a chapter on the lighting of large areas, such as building sites, shunting yards, etc., and another on the lighting of sports grounds. Chapter XII covered the light sources used in public lighting and here the author mentioned that very little use was made of sodium lamps in France. Chapter XIII dealt with fittings and XIV with lamp-posts, including those made of plastics. Of the remaining eight chapters, XIX received special mention as having presented the most difficult problem. This was readily understandable because the subject treated was the assessment of the quality of an installation. M. Gaymard said that full use had been made of the British and Dutch research work in this field. The final chapter summarised the many technical and safety regulations relating to public lighting.

At the meeting M. Gaymard gave only a very brief account of the genesis and objects of the Code. He then showed a large number of slides of French public lighting installations of special interest. The care which had obviously been taken in many cases to avoid making the installation conspicuous caused Mr. Widnall to remark that apparently in France safety considerations had to take second place to aesthetic satisfaction, but this was denied by M. Gaymard.

Public Lighting in Germany

Next came a paper by Dr. E. von der Trappen, a German street lighting authority, who gave an interesting survey of developments over the past few years. He said that until 1955 the tubular fluorescent lamp was the most popular source for street lighting in Germany but it was now giving place to the colour-corrected mercury lamp. At first the fittings used were of the conventional type with three or four 40-watt lamps arranged horizontally one under another. These were suspended over the carriageway, but later on fittings of a similar type were used on bracket arms attached to columns. Then a different type of fitting was designed, a number of 20-watt fluorescent lamps being mounted nearly vertically inside cylindrical or conical diffusers. A large fitting of this kind was mushroom-shaped, with 16 to 24 40-watt fluorescent lamps in the stem and a similar number of 20-watt lamps mounted horizontally in the top. As the light distribution was more or less uncontrolled these fittings were very inefficient; they also caused considerable glare.

In Germany, said Dr. von der Trappen, it was considered that unshielded tubular fluorescent lamps were glaring, especially at low mounting heights. The fittings were therefore redesigned with the lamps side by side and a screen cutting off at an angle of 65°. It was in order to reduce glare, too, that fittings with tubular fluorescent lamps, when suspended over the carriageway, were arranged longitudinally either over the axis of the road or, on wide roads, in two lines. This longitudinal arrangement had the disadvantage that spacings had to be reduced to between 40 and 50 feet and there might be dark lanes at the edges of the roadway.

From among a number of fittings of more recent design, the author referred particularly to the so-called "Chinese hat" fitting. This consisted of a diffusing bowl under a shallow cover, the wide edge of which was a diffuse reflector underneath. This fitting, post-top mounted, could house several high-pressure mercury lamps. At danger spots sodium lamps were used instead. A comparatively new design, used in one of the main squares at Munich, housed three 250-watt mercury and three 140-watt sodium lamps. The mounting height was 40 feet and the colour of the mixed light was similar to that of a tungsten lamp.

Quite recently glass reflector fittings had become available, said Dr. von der Trappen, and he showed a picture of a "large ring fitting" in which six separate reflector fittings were mounted radially on a large metal ring carried at the top of a high column. This was intended for use in a square or on a very wide road.

Colour-corrected lamps were now very popular for street lighting and there were a number of fittings of different designs in which they could be used. At first these had all been of the open type but there was now a demand for enclosed fittings.

It was interesting to learn from Dr. von der Trappen that sodium lighting of the fast motor roads between large towns was under consideration and that, in fact, one such installation had already been completed.

In the final sections of his paper the author dealt with the lighting of bridges and tunnels. He mentioned in particular a tunnel in Stuttgart which was lighted by several lines of fluorescent lamps, with additional 400-watt high pressure mercury lamps at each end to bring the illumination up to 300 lm/ft^2.

The Netherlands

The survey of public lighting overseas was completed by Mr. H. Zijl with an account of post-war developments in Holland. Public lighting, he said, was bound up with motor traffic and the number of motor vehicles on Dutch roads today was roughly three times as great as it was in 1938. Night traffic had increased at least in the same proportion and what Mr. Zijl described as "a rather dangerous new phenomenon, the auto-cycle" had appeared in ever increasing numbers to add to the congestion. Incidentally he mentioned that these "phenomena," known by the expressive name of "bromfietsen" or "buzz-cycles," were treated in Dutch law as bicycles.

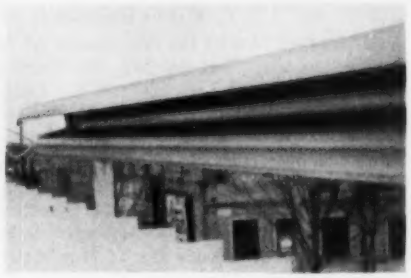
Mr. Zijl said that in the Netherlands the authority which built and maintained a road was also responsible for the lighting, so that national highways were lighted by the Ministry of Transport and Public Works, provincial highways by the provinces, and streets in built-up areas by the municipality. Exceptions occurred when, for instance, a national highway passed through a built-up area. Lighting on private premises, such as a petrol filling station, which might affect road users was subject to approval by the roads department.

National roads were lighted entirely by sodium lamps in cut-off fittings. The typical modern installation had pairs of 85-watt sodium lamps mounted on 30 foot columns at 90 foot spacing. This gave an initial average illumination of about 1.5 lm/ft^2. Generally speaking, this sodium lighting was retained on through roads in towns and cities

(continued on page 366)

RECENT STREET LIGHTING INSTALLATIONS

Milan



A new fly-over bridge leading to several of the main roads leaving Milan was opened in April. It is a concrete structure 640 metres long with a 14 metre carriageway ; the distance between the parapets is 16 metres.

The bridge is lit by fluorescent lamps in the parapet ; the structure of the lighting installation forming in fact the actual parapet.

Each parapet is formed by a continuous line of 249 8 ft. 45-watt slim-line hot cathode fluorescent tubes in a domed box structure the offside of which is closed by an aluminium reflector with the road side closed by a " Perspex " diffuser. The illustration lower right shows one of the fittings without the " Perspex " diffuser during installation. The fluorescent tubes are wired in pairs with twin-lamp ballasts ; the supply is three phase and neutral 380/220 V. Supply cables and ballast are housed in a duct about 16 inches above the pavement level to permit easy access for maintenance. The illumination level obtained is approximately 4 lm/ft^2 at the side of the carriageway and 0.5 lm/ft^2 in the centre. The total load of the installation is 35 kW.

in order to guide the traffic. In Amsterdam, for instance, there were over 20 miles of streets with sodium lighting. Otherwise the lamps used in built-up areas were tungsten, although these were giving place to colour-corrected mercury, not only in squares and important streets but in residential areas as well, now that the 50-watt rating was available. Fluorescent lighting was not much favoured.

Mr. Zijl then described the outstanding installations in the station squares at Eindhoven and at Rotterdam. The 400-watt colour-corrected mercury lamp was used for both. At Eindhoven each 45-foot mast carried four such lamps in cut-off reflectors. The spacing was 100 feet and the initial average illumination about 5 lm/ft^2. At Rotterdam each mast carried 6 lamps at a height of 70 feet and the illumination was rather higher. While these installations were exceptional, there was undoubtedly a general trend towards higher values of illumination and a growing preference for the cut-off system.

Progress in public lighting, said Mr. Zijl, was fostered in Holland in various ways. In particular he mentioned the courses organised for municipal authorities and others responsible for public lighting. These courses were sponsored jointly by the Royal Dutch Tourist Association and the Dutch Illuminating Engineering Society. A committee appointed by these two bodies had been engaged for some time in the preparation of a code of practice which was now nearing completion. A translation into English would be prepared in due course.

A vote of thanks to the authors was proposed by Mr. J. M. Waldram, Chairman of the Committee on Street Lighting of the International Commission on Illumination.

Public Relations

The paper read at the last Session of the Conference, on Friday morning, was by Mr. W. Robinson who took as his subject "Street Lighting and the Public." Dealing first with the reactions of the ratepayer he made an interesting comparison between the cost of street lighting and the cost of all the other services administered by those local authorities responsible for public lighting, *viz.*, county and non-county boroughs, metropolitan boroughs and urban and rural districts. The cost of street lighting per head of population ranged from 11s. 2d. for metropolitan boroughs to 2s. 7d. for rural districts with an overall average of 7s. 2d. Of this amount, said Mr. Robinson, only 2s. 9d. was for energy so that half-night lighting was very difficult to justify. To put into all-night operation the 50 per cent or so of existing lighting now extinguished after midnight would add only 1s. 3d. a year per head to the street lighting bill and this might well be repaid by the resulting increase in police efficiency. In this matter, as in other aspects of street lighting, the realisation of improvements which were socially desirable and technically obtainable were bound up with the financial structure of local government.

Amenity and Aesthetics

From the point of view of the ratepayer Mr. Robinson turned to that of the public specially concerned about the aesthetics of street lighting. He mentioned first the wide variety of opinions regarding sodium lighting, contrasting a journalist's reference to "the bilious tide of sodium lighting" with the remark of a Council official who said of sodium lamps: "In the areas in which we are erecting them we have only one difficulty. That is the demand from neighbouring streets asking if they can have them too."

On the thorny subject of lamp-posts, Mr. Robinson quoted A. E. Matthews, the veteran actor lately much in the news, and John Betjeman, whose opinions are familiar to every street lighting engineer. Perhaps the most helpful opinion was that of Gordon Cullen, who wrote: "What we need to do is to integrate street lighting with the fabric and character of the town, both by day and by night, to manipulate light and the light sources in the full knowledge and love of our towns and cities."

All of us, said Mr. Robinson, desired pleasant things in pleasant surroundings, but it was engineers and councillors who had to tackle the task of providing technically good street lighting within a tight budget. Further, it was not permissible to ignore the fact that heights and spacings could not be altered to fit the heights of neighbouring buildings. He felt that there would always be two camps, but he pleaded that the battle should be fought with fairness. It was hardly fair, for example, to photograph a cathedral from a distance of half a mile in such a way as to show a concrete lamp-post in the foreground overtopping the spire, and then to caption the result "A skyline ruined."

The Council of Industrial Design was working most effectively to reconcile aesthetics with engineering. Its steady efforts towards the simplification and refinement of lantern and column design deserved general support. The COID respected the engineer as much as the artist and if there were ever a settlement between the two it would come about under the Council's flag of truce.

Road Safety

The next section of Mr. Robinson's paper was concerned with the influence of street lighting on accident rates. The work of the APLE in urging the necessity for better street lighting as a means of reducing night accidents, and the investigations carried out at the Road Research Laboratory were apparently bearing fruit at last, for the Parliamentary Secretary to the Ministry of Transport had stated that good street lighting could reduce night accidents by as much as 30 per cent. "What standard of lighting," asked Mr. Robinson, "was needed to give this result?" and "How, and when, will the public get it?" The matter was one of extreme urgency, for the deterioration in the night-time road safety position continued unchecked by all the efforts which had been put into street lighting in the post-war years. This was proved very strikingly by some diagrams in the paper. These showed that in the last 12 years the rate of increase in night-time accidents was considerably greater than the rate of increase by day. Again it was a matter of economics. Engineers had worked wonders with slender resources, but real progress could be made only if it was generally realised that more money would have to be spent on street lighting and that the local authorities where the need for improvement was greatest had frequently the least money available for the purpose.

Co-ordination

The problem of obtaining some co-ordination among adjacent lighting authorities was, said Mr. Robinson, uppermost in the mind of the Minister of Transport and of many others. Once again finance was the bugbear and it was hardly to be expected that neighbouring boroughs with vastly differing rateable values per head of population would hold similar views as regards the standard of street lighting that should be afforded. Moreover, there were disturbing possibilities attendant on efforts at co-ordination. Here Mr. Robinson referred to the recently published "Practice Notes for Street Lighting in London," issued under the aegis of the Metropolitan Boroughs Joint Standing Committee (and noticed in detail in *Light and Lighting* for September). In this document it was suggested that the central area north of the Thames should have lighting with a much higher

luminous output than the Code maximum, and with good colour rendering. Outside the central area, however, on routes with heavy traffic, sodium lighting should be used. The possibility that co-ordination might result in a division of London's street lighting on such lines was, in the opinion of the author, a very serious matter and one that needed most careful consideration.

Finally Mr. Robinson referred to the motorist who, he said, appreciated good street lighting and generally liked sodium installations. It was he who would benefit most from the present move towards co-ordination and yet the motoring associations did not seem to have any strong views on the matter. Again the financial aspect of the problem was a vital one. Without some form of financial rationalisation, such as bringing street lighting within the ambit of the Improvement Grant system, co-ordination would remain outside the realm of practical politics.

The discussion was opened by Mr. S. J. Chamberlain, of the Metropolitan Police Traffic Department, who said that the police put a very high value on good street lighting. The improvements which had taken place over the years were very noticeable and had undoubtedly helped to reduce the growth in the night accident rate. He made the important point that good street lighting in a particular road might well affect the accident statistics elsewhere, either because it put less strain on the driver who was therefore fresher during subsequent stages of his journey, or because it attracted traffic from less well-lighted roads and so reduced the hazards there.

Mr. C. N. Cowney, the chairman of the new co-ordinating committee mentioned at the luncheon by Mr. Nugent, said that the author had not been quite fair in his reading of the "Practice Notes." There was certainly no intention that lighting with good colour rendering should be restricted to the Oxford Street area. He was insistent that local authorities with improvement schemes in mind should press on with them and not wait for the report of the co-ordinating committee.

Mr. P. Whitworth, of the Council of Industrial Design, expressed his appreciation of the remarks made during the Conference with reference to the work of the Council. He said that it was encouraging to notice the growing tendency to design a column and a fitting in harmony with each other and he thought the manufacturers were to be congratulated on their efforts to produce good designs.

Mr. G. Norman, after a forthright remark that antiquity and beauty did not necessarily go together, expressed the opinion that co-ordination should not be confined to the London area. He went on to draw the attention of manufacturers of columns to the fact that doors were frequently not designed to withstand the attentions of the mischievous and, further, that every type of door seemed to need a different key.

Mr. Robinson replied briefly to some of the points raised in the discussion and a vote of thanks, proposed by Mr. J. H. Morrison, was carried by acclamation.

At a brief final session, the President expressed the thanks of the Association to all those who had helped towards the success of the Conference and it was then formally closed.

RECENT STREET LIGHTING INSTALLATIONS

Eton

AEI wall mounted fluorescent lanterns in the High Street at Eton. Each lantern houses two 5 ft. 80-watt tubes.

Reigate

Stewarts and Lloyds 25-ft. steel columns in a new main road installation at Merstham for the Reigate Corporation.

General view of the outdoor display at the APLE Exhibition

Exhibition of Street Lighting Equipment at Harrogate

Some comments on the APLE Exhibition by W. Robinson

This year's APLE exhibition was well up to the standard of previous years and contained much of interest and some important innovations.

Lamps

Undoubtedly the most interesting amongst the new items was the 280-watt Integral Sodium lamp by the General Electric Co. The method adopted to produce this loading within the original lamp length shows the typical GEC commonsense approach. They simply added a second U-tube within the envelope, thus enabling the lamp to be used in existing 140-watt sodium lanterns with the use of a lampholder adaptor and the addition of a second control unit. This lamp comes at a most opportune time in view of the growing call for increased lantern outputs on major thoroughfares. An interesting feature of the lamp is that the overall light output is some 90 per cent of that from two 140-watt lamps, a remarkable result in view of the very considerably increased internal obstruction and one which suggests that we may have to revise the commonly held view that discharge lamps totally absorb light of their own frequency.

All fluorescent lamp makers featured the increased lamp efficiencies, between 10-15 per cent, another useful step towards up-grading the performance of existing street lighting installations. A noticeable omission was any great emphasis on the very high output (120-watt 5ft.) fluorescent tube whose introduction had been confidently expected by now. There is obviously some heart searching going on about this project and, equally obvious, lamp manufacturers are not unanimous as to its readiness for commercial introduction. We may nevertheless expect at least one manufacturer to introduce it shortly.

The Philips stand produced its usual lively impact. Of particular interest were: the new de-luxe colour corrected mercury fluorescent lamp range with a remarkably good red component (of course with an inevitable efficiency penalty); the extended range of MBF/U mercury lamps including the 50- and 700-watt versions with the conversion of sizes from 250-watt upwards from the low pressure (MA) to the high pressure (MB) type; the extended range of circular fluorescent lamps, of 22, 32 and 40 watts; the high lumen coiled-coil filament lamp; the internally colour-coated filament lamps with obviously increased colour maintenance and weathering properties.

In addition Philips did not hesitate to show some purely experimental lamps and invite the reactions of visitors to them. This is an intriguing policy and how can we fail to commend it at a time when commercial policy usually lies in the direction of stealing a march on competitors, and inevitably on the user too! Included in this category were two approaches to the 280-watt sodium lamp, both being double ended, one consisting of two 140-watt U-tubes laid end to end in a double-length envelope, the other taking the form of a double-length U-tube in a similar envelope. Whether either of these forms will have the same appeal as the GEC version is open to doubt for obvious reasons, but the extra length has possibilities in terms of street lighting performance which could make them attractive despite higher lantern costs.

Another feature of interest in the exhibition was the incorporation by Siemens Ediswan of the hitherto neglected 3ft 30-watt fluorescent lamp in their "Corporation" and "Chester" ranges of lanterns; a useful addition to the equipment available for roads of intermediate traffic status.

Lanterns

Siemens Ediswan gave particular prominence to their new wall mounting lanterns for both Group A and Group B lighting which were shown alongside the well-known City lantern. Features of this firm's lanterns are the standardisation of component fittings for each lantern and the special "Haligloss" finish claimed to give extremely high durability and corrosion resistance Also shown on this stand were the extended "Kuwait" range; the "Corporation" range of reflector and refractor side entry lanterns; the "Chester" range of reflector lanterns; the "Conway" horizontal wall mounting lantern; the "Cathay" post top lantern with refractor or opal bowl and the "Foochow/Bhari" enclosed post top lantern with a wide choice of coloured canopies in steel, aluminium or "Perspex."

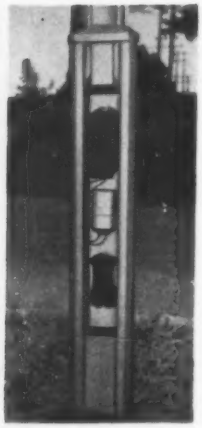
Holophane featured their glass refractor systems including the oval bowl for 250- and 400-watt MBF/U and MA/U lamps with tilting facilities permitting either a non-axial asymmetric distribution or a wide asymmetric distribution. Also shown were the "Acorn" mercury (400-watt MBF/U), the "Cylindrical" 140-watt sodium lamp lantern, the virtually all-glass Group B "Lumifractor," and the "Muralux" side of house lanterns.

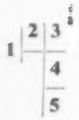
AEI showed their "Kirby" and "Ashton" pole top Group B lanterns with diffusing glass bowls. Incidentally a noticeable tendency at the exhibition was the substitution of diffusers for refractors in Group B lanterns, in line, no doubt, with the increased emphasis on appearance and the decreased emphasis on precise light control for Group B lighting. Also shown by AEI were the new "Kington" 3-lamp fluorescent reflector lantern and "Newton" lantern for colour corrected mercury lamps.

GEC showed their new post top fluorescent lanterns, a Group A lantern for colour corrected mercury lamps and their "Casablanca" shallow fluorescent lantern.

Revo showed an interesting tilted lantern for post top mounting while Barnard and Buecheler entered the street lighting field with a unique all fibre-glass lantern for which they claim exceptionally low maintenance costs.

The Atlas display reflected their forward outlook, a prominent exhibit being the new "Gamma Four" lantern housing two colour-corrected mercury lamps and intended





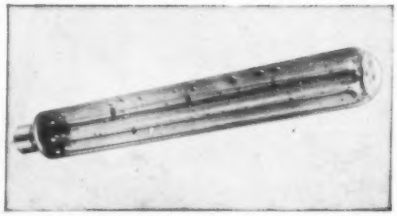
1 AEI "Leader" 15-ft. aluminium column.

2 Base of the "Leader" column showing control gear department.

3 AEI "Ashby" post-top lantern.

4 AEI "Kirby" top entry lantern for GLS or colour-corrected mercury lamps.

5 GEC 280-watt sodium lamp.



for situations calling for lighting levels beyond the Code of Practice. This post top lantern is of striking appearance and can be supplied with or without a positive light control system. A smaller partner of the "Gamma Four," the "Beta Four" Group B lantern for tungsten or mercury was also shown. The by now well-known "Alpha One" sodium lantern was shown, now bearing the accolade of a Gold Medal in the Eleventh Milan Triennale. Atlas have shown vision in recognising the need for a positive cut-off above the main beams in the case of colour corrected mercury lamps and have incorporated reflector control in such lanterns in lieu of the relatively large refractor systems which positive cut-off would require. They have also shown vision in the care they have taken with the "appearance design" of all their lanterns.

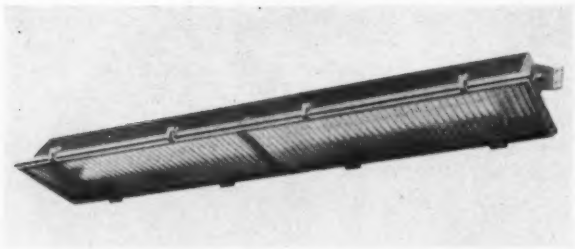
Benjamin showed their wide range of exterior lighting equipment including their new "Mushroom" fitting with a range of outdoor applications going beyond street lighting.

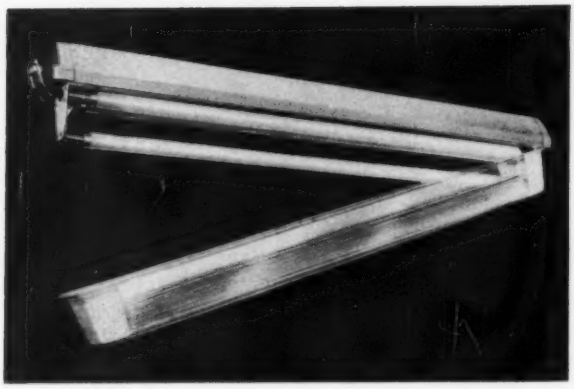
The Engineering and Lighting Equipment Co. showed, in addition to their normal range, the new "Eleco Two" 2 ft. fluorescent fibre-glass lantern and their new post top type for tungsten, mercury or sodium lamp.

Other Equipment

As usual there was a comprehensive display of related and illuminated street furniture. Fluorescent bollard lighting predominated with conversion packs much in evidence. Franco Traffic Signs showed a new fluorescent version of their external signboard light, the "Exlite III." Gowshall showed, in addition to their usual range, their "Perma Posts" consisting of tough p.v.c. sheathing for slipping on to columns and posts. Bergo exhibited their "Bergoband" plastic sleeves, a special portable bollard using bottled gas, and fog bollards using sodium lamps.

Venner and Sangamo Weston gave their usual comprehensive display of time switches, instruments and meters, and Horstmann showed their controllers and time switches. In the important field of traffic signals the Siemens and General Electric Railway Signal Company exhibited their new "Minimum Green" controller giving automatically varying minimum green timing to speed up traffic flow,





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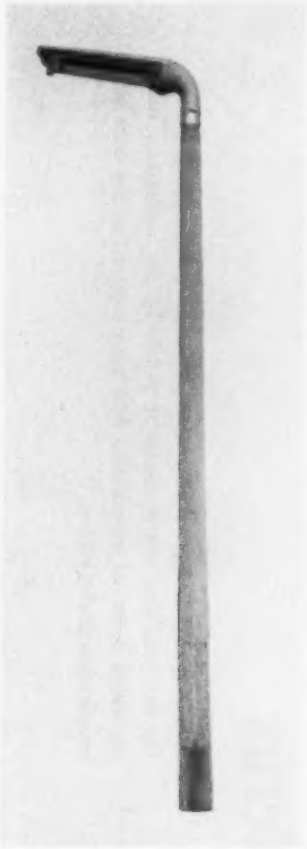


6 Siemens Ediswan "Conway" horizontal mounting fluorescent wall lantern.

7 GEC "Casablanca" type lantern which is available for various sizes of fluorescent lamps.

8 Siemens Ediswan timber column.

Other new lanterns shown at the APLE conference are included in the review of new lanterns on pages 372-376.

and separately timed amber periods to opening and closing roads. Automatic Telephone and Electric Co. exhibited its "Electromatic" vehicle actuated traffic signals, including the Type 54 controller which makes much greater use of vehicle actuation including also a varying minimum green period. Many motorists will bless these developments and, at the same time, wonder why they have had to wait so long for something to be done about this vexing problem of unnecessary traffic light delays.

Columns

The outdoor column display gave satisfaction to many, particularly in respect to the emerging "new look." A greater proportion than ever before were COID approved types, and while space does not allow a detailed analysis of the column exhibits the aluminium poles exhibited by AEI and the Siemens Ediswan columns in Malayan or Kapur timber deserve special mention for their novelty.

Unclassified

EDA, having nothing tangible to sell, made its contribution in the form of facts, figures and observations relative to street lighting finance, road safety and even aesthetics, an exercise which, if it accomplished nothing else, did inspire much informal discussion and, perhaps, some new thoughts for visitors to carry away with them.

Afterthoughts

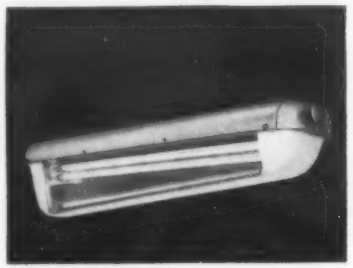
One feature which was noticeable about the exhibition was the absence of a number of former regular exhibitors. One of these suggested, in a statement in the Conference Handbook, that the value of exhibitions such as this had been nullified by the adoption of price, rather than quality, as the ruling factor.

It cannot be denied that recent events in the trading world have made the lighting equipment business more competitive and there is a temptation to allot the money formerly spent on exhibitions towards price reductions. This is a hopelessly defeatist outlook when viewed in the light of the industry as a whole. It would be legitimate if the market for street lighting were static, and if the sole purpose of the exhibition were to provide an arena for sales competition, but the exhibition serves a bigger purpose. It is an established part of the conference, a rendezvous for the entire street lighting world, whether as seller, buyer, students, engineers or researchers. It attracts publicity to the conference and mirrors the gap between street lighting as it is, and as it can be. It is a weapon in the drive for more and better street lighting at least as powerful as the conference sessions themselves. Above all the APLE annual exhibition is unique in that it associates the makers and the buyers of lighting equipment in a common enterprise in a unique way. May it long continue.

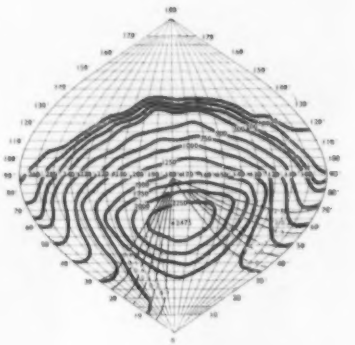
New Street Lighting Lanterns

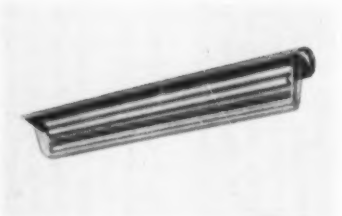
The technical data given below refer to lanterns introduced during the past year and now available to public lighting authorities and on which technical information had been received at the time of preparation of this review.

Fluorescent lamp lanterns

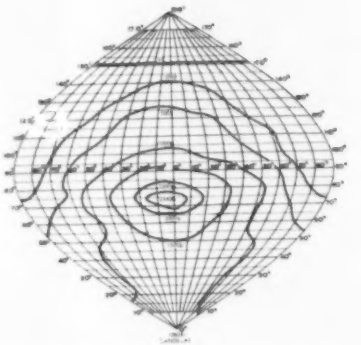


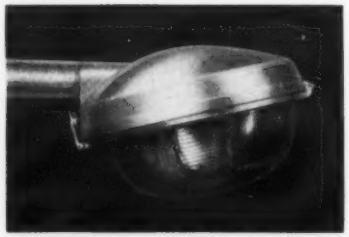
Lantern	Lamp	Construction	Optical system	(a) Efficiency (b) D.I.R.
AEI "Kington" Group A	Three 5 ft. 80-watt tubes (MCFA/U or MCF/U.	Canopy of magnesium aluminium alloy with silicon aluminium end castings. "Perspex" bowl. Control gear in tray above reflectors. Side entry for mounting at 10° above horizontal.	Anodised aluminium reflectors.	(*a*) 80% (*b*) 1.86



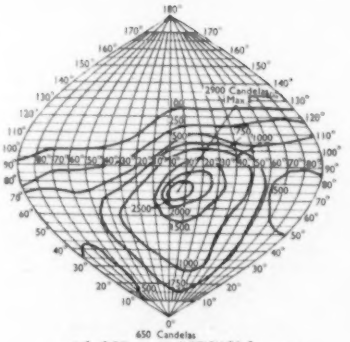


GEC Tapered "Three-Eighty" Z8387 Group A	Three 5 ft. 80-watt tubes. (Two- and four-tube versions available).	"Perspex" bowl. Top hinged for access to control gear. Side entry mounting.	Tapered refractor plate sealed to enclosure.	(*a*) 75% (*b*) 1.98



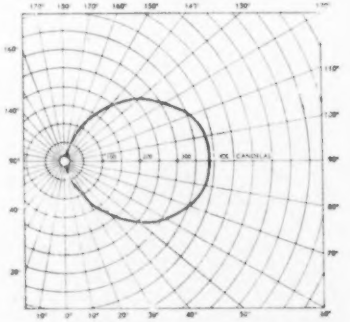


Lantern	Lamp	Construction	Optical system	(a) Efficiency (b) D.I.R.
GEC Z8429/30CM. Group A	250- or 400-watt colour-corrected mercury (MBF/U)	One-piece alloy diecasting. Top or side entry mounting.	Pressed prismatic glass refractor bowl.	(*a*) 70% (*b*) 3.32 (*250-watt MBF/U lamp*).

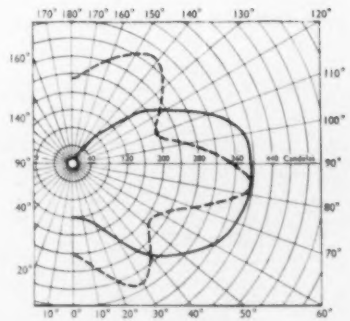


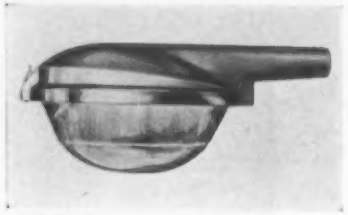
with 250-watt MBF/U lamp.

GEC ZD10288 Group B	Four 2 ft. 40-watt tubes.	Opal "Perspex" tapered cylinder. Aluminium body spinnings. Control gear in top. Post-top mounting.	—	(*a*) — (*b*) —

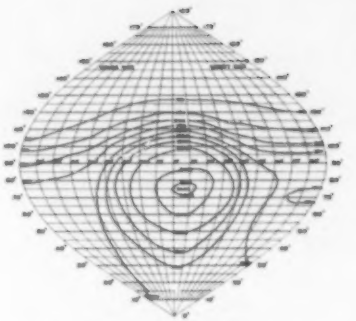


GEC ZD10290 Group B	Two 2 ft. 40-watt tubes.	"Perspex" tapered cylinder. Aluminium body spinnings. Control gear in top. Post-top mounting.	Vertical mounted sealed-in refractor plates.	(*a*) — (*b*) —



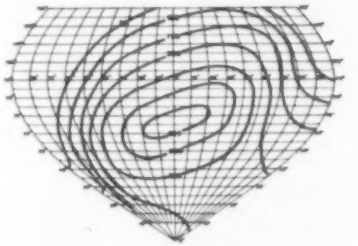


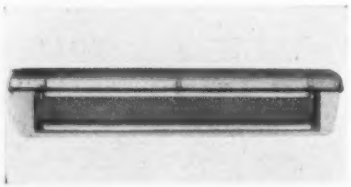
Lantern	Lamp	Construction	Optical system	(a) Efficiency (b) D.I.R.
Holophane 22/4257D Group A	250- or 400-watt colour-corrected mercury (MBF/U) or mercury (MA/U)	Silicon aluminium alloy. Side entry mounting. May be tiled up to 15° above horizontal.	Prismatic glass refractor.	(*a*) 67% (*b*) 2.6



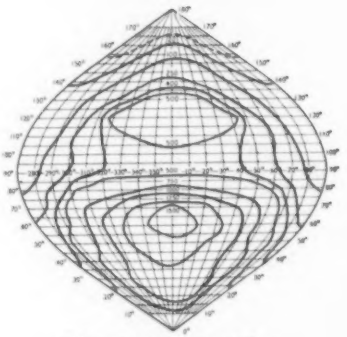
with 400-watt MBF/U lamp.

Revo "Junior" Soletern" C.15160 Group B	Two 2 ft. 40-watt tubes. (2 ft. 20-watt version available).	One-piece clear "Perspex" enclosure with white top. P.V.C. end-cap. Control gear in tray in top. Envelope slides off to give access to lamps and gear. Post-top mounting.	Envelope with sealed refractor plates available.	(*a*) — (*b*) —



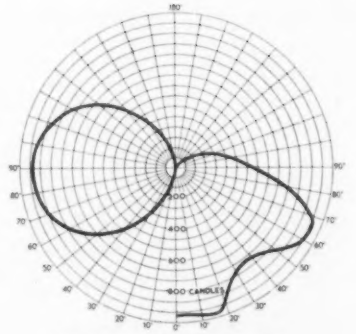


Siemens Ediswan "Corporation" Groups A or B	Three 5 ft. 80-watt tubes. (Versions for 2 ft., 3 ft. and 4 ft. tubes available).	Steel frame. Steel roof. Aluminium end castings. Control gear in trays above reflector. "Perspex" bowl. Side entry mounting.	Reflector and refractor versions available. Refractors are sealed to the bowl.	(*a*) 75% (*b*) 2.0 (*Three 5 ft. 80-watt refractor lantern*).

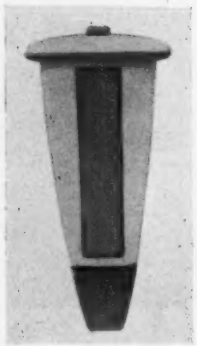


with two 5ft. 80-watt tubes.

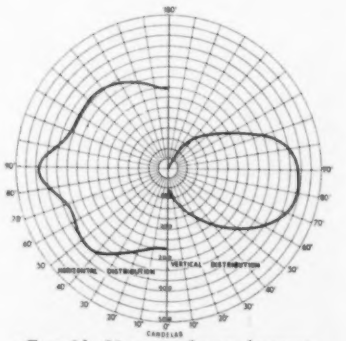
Lantern	Lamp	Construction	Optical system	(a) Efficiency (b) D.I.R.
Siemens Ediswan "Chester" Groups A or B	Three 5 ft. 80-watt tubes. (Versions for 2 ft. 3 ft. and 4 ft. tubes available).	Vertical wall mounting. Steel case and spine. Aluminium end castings. "Perspex" bowl—clear, stippled, or reeded. Detachable control gear tray; reflector cover plate.	Reflector.	(*a*) 66% (*b*) 2.62 (*Three 5 ft. 80-watt lantern*).



with three 5ft. 80-watt tubes.

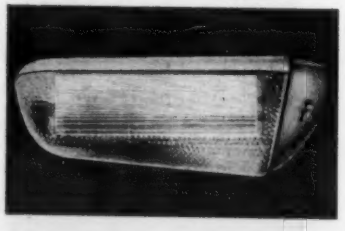


Siemens Ediswan "Cathay" Group B	Four 2 ft. 20-watt tubes.	Aluminium alloy base. Central steel channel. White "Perspex" canopy. "Perspex" opal envelope. Control gear in base and on channel. Post-top mounting.	Refractor plates sealed to bowl. Plain opal "Perspex" bowl version available.	(*a*) 70% (*b*) 1.7 (*Four 2 ft. 20-watt lantern*).

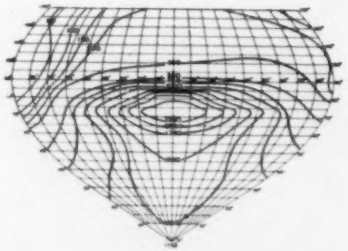


Four 2ft. 20-watt refractor lanterns.

Sodium lamp lanterns



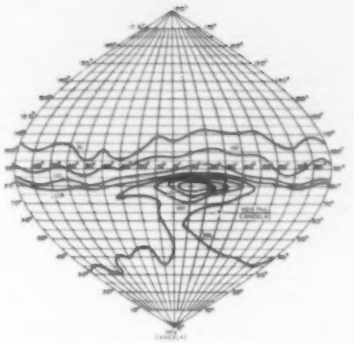
Revo "Sol-D'or" C.15154 Groups A or B	85/140-watt sodium. (Version for 45/60-watt lamp available).	Cast aluminium body. Single-piece "Perspex" envelope. Envelope withdraws for access to lamp. Side entry mounting.	Refractor plates sealed to envelope.	(*a*) 91.4 (*b*) 2.14 (*140-watt lamp*).



with 140-watt lamp.

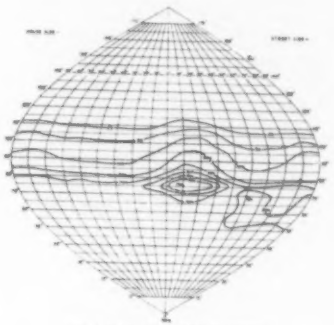
Tungsten lamp lanterns

Lantern	Lamp	Construction	Optical system	(a) Efficiency (b) D.I.R.
GEC "Brookvale" Z5530 Group B	60/200-watt tungsten lamps or 80/125 mercury or colour-corrected lamps.	Die-cast light alloy body. Glass or "Perspex" globe. Top entry mounting.	Bowl or dome refractor.	(*a*) — (*b*) —



with 200-watt GLS lamp.

Wardle "Avon" Group B	Up to 200-watt tungsten lamps or 80/125 mercury or colour-corrected lamps.	Body in cast iron or cast aluminium. Clear glass or "Perspex" globe. Top or side entry mounting.	Reflector and dioptric dome refractor.	(*a*)71.2% (*b*) 2.8 (*200-watt GSL lamp*).



with 200-watt GLS lamp.

Names and addresses of firms whose lanterns are described on pages 372-376

A.E.I. Lamp and Lighting Co. Ltd., Melton Road, Leicester.

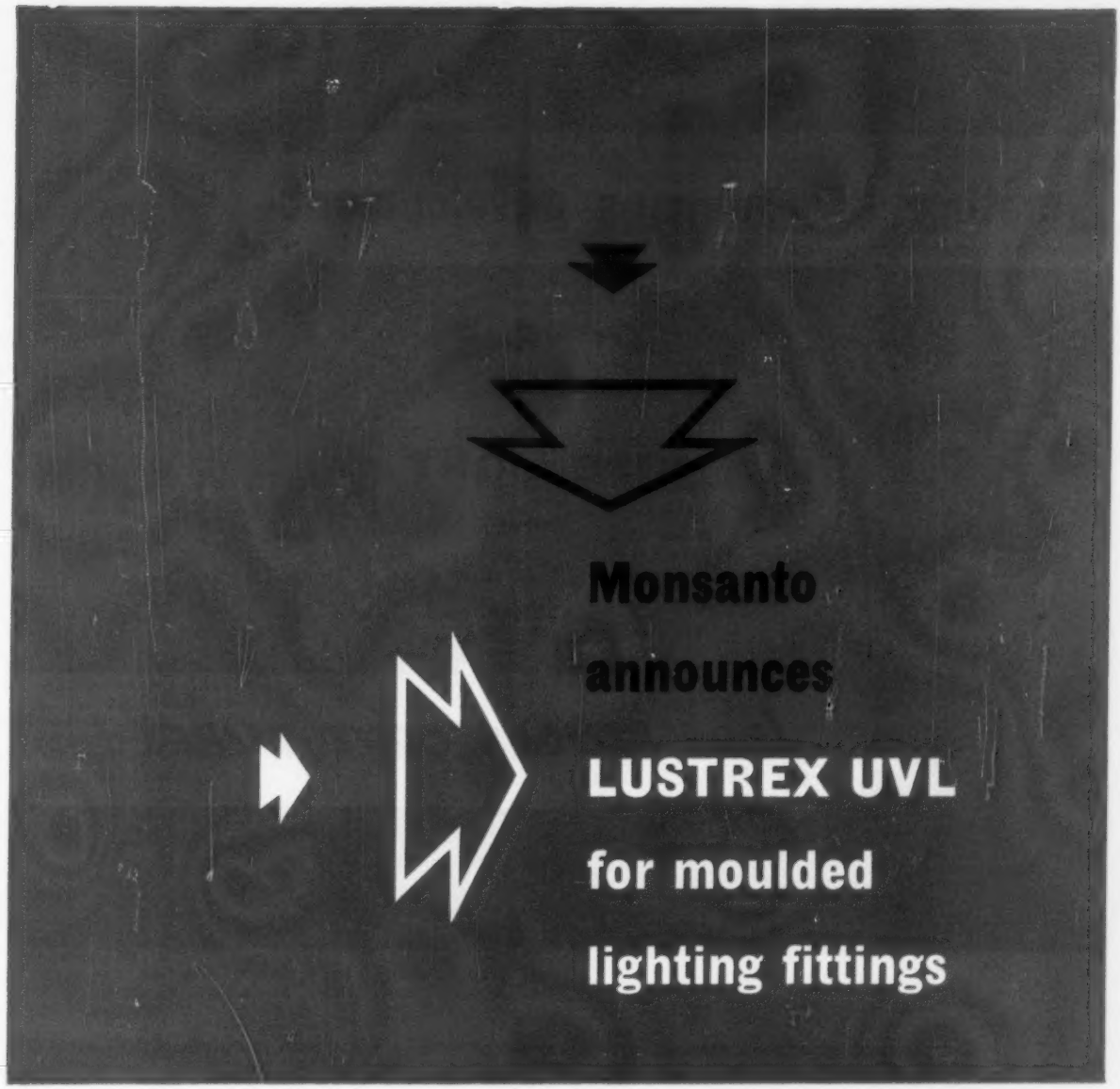
General Electric Co. Ltd., Magnet House, Kingsway, London, W.C.2.

Holophane Ltd., Elverton Street, Vincent Square, London, S.W.1.

Revo Electric Co. Ltd., Tividale, Tipton, Staffs.

Siemens Edison Swan Ltd., 38-39, Upper Thames Street, London, E.C.4.

Wardle Engineering Co. Ltd., Old Trafford, Manchester, 16.



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FORTHCOMING EVENTS

LONDON

November 11th

"Some Practical Considerations in the Design and Manufacture of 'Neon' Signs," by A. Urquhart. (At the Federation of British Industries, 21, Tothill Street, S.W.1) at 6 p.m.

CENTRES AND GROUPS

November 3rd

LEEDS.—"Australian Journey," by W. E. Harper. (At the Yorkshire Electricity Board, Ferensway, Hull.) 6.30 p.m.

November 5th

EDINBURGH.—"Problems Associated with Luminaire Installation Practice in Mining," by W. B. Bell. (At the Y.M.C.A., 14, South St. Andrew Street, Edinburgh.) 6.30 p.m.

NEWCASTLE-UPON-TYNE.—Members' Night. "Interesting Lighting Installations"—papers by Centre members. (Kings College, Newcastle-upon-Tyne.) 6.15 p.m.

November 6th

BIRMINGHAM.—Ladies' Night. (At the Botanical Gardens, Edgbaston.)

CARDIFF.—"The Optician's Approach to Lighting," by K. Edwards. (At the Demonstration Theatre, South Wales Electricity Board, The Hayes, Cardiff.) 6 p.m.

GLASGOW.—"Problems Associated with Luminaire Installation Practice in Mining," by W. B. Bell. Joint Meeting with AMEME, West of Scotland Branch. (At the British Lighting Council, 29, St. Vincent Place, Glasgow.) 6.30 p.m.

MANCHESTER.—"Links between Colour and Lighting in Buildings," by H. L. Gloag. (At the North Western Electricity Board, Manchester.) 6 p.m.

NOTTINGHAM.—"Lighting of Aircraft Control Panels," by J. W. Strange and B. Stevens. (At the Electricity Service Centre, Nottingham.) 6 p.m.

November 10th

SHEFFIELD.—Presidential Address, by C. C. Smith. (At the Grand Hotel, Sheffield.) 6.30 p.m.

November 12th

MANCHESTER.—Annual Dinner. (At the Café Royal, Peter Street, Manchester.) 6.30 p.m.

November 17th

BATH AND BRISTOL.—"The Stage and Lighting Engineer," by F. P. Bentham. (At the Lecture Theatre, South Western Electricity Board, Bristol.)

November 18th

LIVERPOOL.—"Recent Industrial Installations and Some Particular Problems," by J. G. Holmes. (At the Merseyside and N. Wales Electricity Board Industrial Development Centre.) 6 p.m.

November 19th

NORTH LANCASHIRE.—"The Use of Lighting for the Prevention of Crime and Accident," by Inspector J. J. Betts. (At the Demonstration Theatre, North Western Electricity Board, 19, Friargate, Preston.) 7 p.m.

November 21st

LEICESTER.—Social Evening. (At Coronation Hotel.)

November 24th

LEEDS.—"Australian Journey," by W. E. Harper. (At the British Lighting Council, 24, Aire Street, Leeds.) 6.15 p.m.

LEICESTER.—"Work of the Building Research Station," by P. Petherbridge. (At the Demonstration Theatre, East Midlands Electricity Board, Charles Street, Leicester.) 7 p.m.

November 28th

BIRMINGHAM.—"Headlamps and Signals for Motors Cars," by J. H. Nelson. (At Regent House, St. Phillips Place, Colmore Row, Birmingham.) 6 p.m.

GLASGOW.—Luncheon Meeting.

Trade Literature

ATLAS LIGHTING LTD., 233 Shaftesbury Avenue, London, W.C.2.—Broadsheet giving details of the efficiency of Atlas "White" and "Warm White" fluorescent lamps.

J. A. CRABTREE AND CO. LTD., Lincoln Works, Walsall. — Publication No. 1194 giving full details and prices of wiring accessories, including several new additions.

LINOLITE LTD., 118 Baker Street, London, W.1.—Catalogue No. 34 illustrating fittings, strip reflectors and signs for domestic and commercial use. Separate price list enclosed.

PHILIPS ELECTRICAL LTD., Century House, Shaftesbury Avenue, London, W.C.2.—Booklet and wall chart giving full details and prices of lamps for all private cars, commercial vehicles, scooters, etc.

ROTAFLEX (GREAT BRITAIN) LTD., 4-10 Nile Street, London, N.1.—Catalogue illustrating fittings made from spun cellulose acetate which are both strong and light in weight, including ceiling fittings, wall brackets, table and floor standards.

ROWLANDS ELECTRICAL ACCESSORIES LTD., R.E.A.L. Works, Birmingham 18.—Catalogue No. P.5806 illustrating R.E.A.L. Non-Corrodible Lighting Fittings including "Reflectortight" and "Porcelain Watertight" fittings.

SCAFFOLDING (GREAT BRITAIN) LTD., Mitcham, Surrey. — Brochure illustrating the new SGB modular and luminous ceilings for offices, stores, schools, hotels, showrooms and factories.

STELLA LAMP CO. LTD., 158/160 Shaftesbury Avenue, London, W.C.2.—Two new catalogues covering the range of Stella lamps and lighting fittings for 1958/59.

THE TELEGRAPH CONSTRUCTION AND MAINTENANCE CO. LTD., Mercury House, Theobald's Road, London, W.C.1. — Catalogue describing fully the Telcon audio frequency cables for junction and trunk wiring.

VICTOR PRODUCTS (WALLSEND) LTD., G.P.O. Box No. 10, Wallsend-on-Tyne.—A Technical Bulletin, No. 44, giving brief explanations of several technical terms used in lighting.

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POSTSCRIPT By 'Lumeritas'

SINCE I commented on the new American IES recommended levels of illumination and those of the new Russian lighting code, I have been looking at the latest Australian Standard Code for the Artificial Lighting of Buildings. In this, the values recommended are more in keeping with European than with American values. The code includes an extensive schedule of specific tasks but for only a few of these is the level recommended "100 and over" lumens per square foot. For surgical operations the code specifies "300 and over" but this is the only listed task so highly rated. Six general classes of visual task are recognised and for this series the corresponding illumination minima cover the same approximately geometric series as in scale A of the British IES Code and the basic "sequential order" of values in the latest American IES recommendations. The only indication that, in the limit, 1,000 lm/ft² may be used locally is given by the scales relating local illumination values to minimum values of general illumination: these scales are a familiar feature of our own lighting code. There are other features of the Australian code which are noteworthy—particularly the rules referring to the avoidance of direct and reflected glare. But the recommended levels of illumination are practically the same as in the 1942 Australian code; whereas, in the same lapse of time, USA levels (which were higher at the outset) have been more than doubled.

USERS of lighting—and this means all of us—may well be at least a little perplexed by the differences which are apparent in the levels of illumination recommended in different countries for similar purposes. It is usual to account for these differences in terms of the rewards to be got according to whether one adopts A's recommendations or those of B or C. There may, of course, be significantly different rewards or effects and adequate evidence in proof of this. But it is unlikely that there will be unequivocally different results except from the use of *very* different values of illumination. Apart from national differences in chosen lighting standards—which may be due to different objectives—levels of illumination in all countres have been raised more than once in our time, as and when higher levels have been shown to be advantageous to the user, and also because higher levels have become possible without increase of cost, or even at lower cost. How far can this upgrading be expected to go? According to *Light*—a house journal of the General Electric of America—it will go on until working illuminations run into the thousands of "foot candles".

ALREADY, at Nela Park, a trial installation giving 1,000 lm/ft² is in use for general machining and assembly. The lighting load?—35 watts per square foot! The results?—"High degree of visual comfort." One cannot help wondering whether the degree of "visual comfort" so far exceeded that obtainable with 100 lm/ft² as to justify the 10-times higher illumination; but this is something which cannot be verified. Another question that comes to mind is how thermal discomfort is avoided with a lighting installation involving the dissipation of at least 3.5 watts per cubic foot of space? A recent advertisement of a Michigan "lighting fixtures" manufacturing company pictured the "world's brightest office" in which they have provided a general illumination of 600 lm/ft²! What, I wonder, does the occupant of this office need to see? Even a 5th carbon copy only requires 133 lm/ft², as determined by the Blackwell Visual Task Evaluator, and poor pencil writing only requires 63 lm/ft². According to this company, "every day recommended foot candle levels are going up" and "the Sight Barrier or comfortable lighting level will be determined by the fixtures which produce the illumination." "As yet," we are told, "there is no known limit on how high we can go!" And, the "Sight Barrier" can be crossed with "controlled brightness" fixtures. Do you want to cross the sight barrier, dear reader? Or do you think you could work comfortably in your office with something nearer to 60 than to 600 lm/ft²?

LEST the foregoing comments be taken to indicate that I am anti-high-illumination, I may mention that I use over 30 lm/ft² for reading in bed (it is only in bed that I find time for recreative reading), and this, I think, is probably a higher level than is used in the majority of homes for any purpose. But then, I am getting into the "sere and yellow" and am well aware of the need for more light than I used to find satisfactory. Indeed, my reading light is up to the standard currently recommended by the American IES! But I am also well aware that it has been shown experimentally, and by experience, that much more than 30 lm/ft² is helpful for many visual tasks which are more exacting than ordinary reading, although I believe the values specified in the British IES Code for these difficult tasks need not be doubled or trebled. We all know that a moderate amount of suitably directed light may be more revealing than 10 or 100 times as much unsuitably directed light.

IF the speed with which the initial stage of vision (the retinal photochemical reaction to light) can take place was the limiting factor in the speed of perception, there might be no limit to the amount of illumination which could be used to quicken sight. But, in fact, the speed of ordinary seeing is limited by other factors, and one of these which seems seldom to be realised is the speed with which the necessary movements of the eyes can be accomplished—the rotations which transfer the gaze from one object to the next, and the movements for convergence and focusing. These cannot be speeded up by more and more light in the same way that the retinal impression can be. The right way to "look at" looking is to regard the eyes as a third pair of limbs which we constantly have to more in sensing our visual environment. And, although Nature has made our eyes "slippery"—as Cicero put it—and easily moveable, it takes longer to execute the movements of sight than it does to excite the retina by very bright light.

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Outstanding features include a specially patented reflector-refractor prism control system; injection moulded refractor plates of acrylic plastic; long life Atlas fluorescent tubes which, combined with the unique weatherproof construction of this lantern, ensure long maintenance-free periods and first-class performance.

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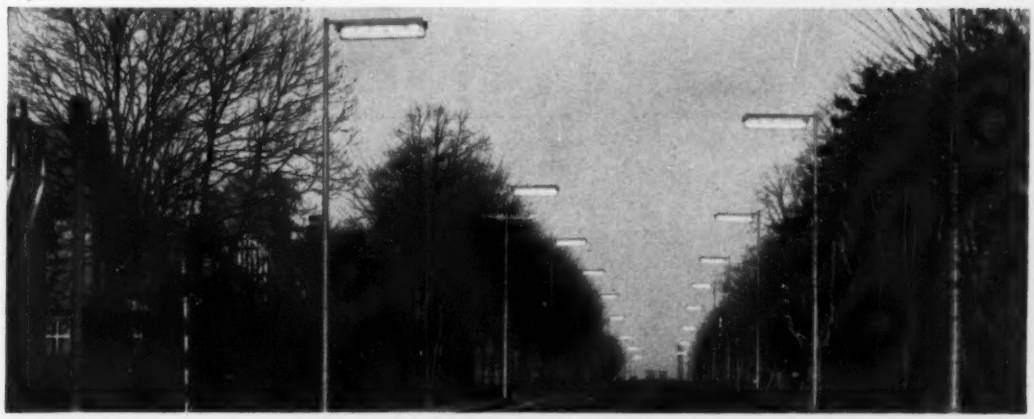
Alpha One lanterns at Luton, Beds.

Alpha Two lanterns at Newmarket, Suffolk



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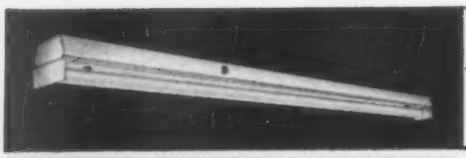
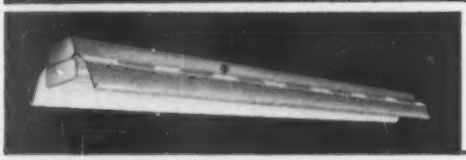
	Battens				
	Single	F51081	£ 6.10.0	F41081	£5.11.0
	Twin	F52081	£10.16.0	F42081	£8.15.0
	Reflectors				
	Single	F51082	£ 7.12.0	F41082	£6.12.0
		F51083	£ 7.12.0	F41083	£6.12.0
	Twin	F52082	£11.18.0	F42082	£9.16.0
		F52083	£11.18.0	F42083	£9.16.0
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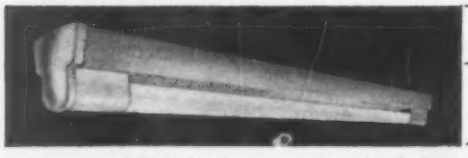	F51035	5 ft.	£5. 5.0	F41035	4 ft.	£4.11.0
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